Introducing This Collection

RICHARD A. MARCANTONIO, JOHN PAUL LEDERACH, AND AGUSTÍN FUENTES

I.1 Concerning Environmental Violence

We live in a time of immense juxtaposition. On July 28, 2022, the United Nations General Assembly (UNGA) voted – by a count of 161 in favor, with eight abstentions – that living in a clean, healthy, and sustainable environment is a human right [1]. Building on the similar declaration by the United Nations Human Rights Council in October 2021 [2], the UNGA has now reinforced the notion that the growing assaults on human health through environmental hazards are transgressions against the basic rights and freedoms of people. Efforts toward the construction of a human right to healthy planet, and even a planetary right to health signifying potential rights of nature [3, 4], are growing both in real activity and demand [5]. But why are such declarations and efforts needed? Likely because of the current human-modified conditions of our planet. For example, more than 90% of the world's population is not able to enjoy this alleged human right due to toxic pollution exposures alone [6, 7]. Or the fact that we are now believed to be exceeding several critical earth systems' planetary boundaries, which could result in rapid deleterious changes rippling through the global ecosystem [8, 9] – an outcome many suggest is already transpiring today, to varying degrees, such that massive systemic ecological collapse and increased global suffering may be no more than a few decades away [10].

However, in contrast to the dire state of the planet on many counts, many humans are living longer lives than ever before [11]. Infant mortality is at its lowest levels in our evolutionary history [12]. And much of humanity has the greatest technological and material access and use, and abuse through excess use, of any humans to walk the earth. Maybe tellingly, malnutrition had been decreasing globally for decades due to changes in food production. However, in the last few years human systems hit an inflection point and malnutrition is on the rise again but with geographic variations. There are an estimated 100 million more people expected

https://doi.org/10.1017/9781009417150.001 Published online by Cambridge University Press

to be considered malnourished in 2030 than in 2018 as a result of ongoing climate change dynamics and exacerbated by COVID-19 [13]. How is humanity to hold these disparate yet intricately interwoven realities? On the one hand the incredible contemporary potential for human flourishing, on the other hand a planetary system deteriorating, supplanting flourishing, and supplying suffering. Is the human knack for innovation in the face of environmental changes now exceeded by the social, political and economic constraints some human groups, institutions, and corporations have overlaid on the planet [14, 15]?

This collection, and the concept and framework it centers on, is intended to address exactly this complex dynamic: to name it and frame it. The UN declarations, like other attempts to rally widespread willingness to curtail human contributions to climate change, have not yet elicited the desired response. Our hope is that the conceptualization of *environmental violence* will be a critical tool in the toolbox for resistance and systemic, even radical, change that can address the cumulative and ongoing deleterious inputs of human activity into the earth system to create the conditions for a transition to human and planetary flourishing in a just and equitable manner. Environmental violence is harm due to excess pollution put into the earth system through human activities and processes. Environmental violence is not the only mode of framing the myriad ills facing humanity and the planet, but as a tool it is designed to map, trace, and draw out the multitude of potential and realized pathways of harm from environmental hazards framed in the antecedent conditions and impact-mediating contexts that are integral parts of the whole of the violence facing humanity and the planet.

The earth system has never been more modified by human action than it is today, the mark of the Anthropocene [16, 17]. A central mark of the human touch is EV, constituted by a range of novel and/or unprecedented intensities of toxic and non-toxic pollution. These materials are increasingly emitted through production, consumption, and the corresponding waste byproducts, either in making them or in the disposal of them, which cumulatively portend a future where no living thing is unscathed by the human touch. Our current era has been dubbed many names – the Capitalocene [18], the Sixth Extinction [19], the Pyrocene [20], the Synthetic Age [21] – but all signify a moment in our evolutionary history where the human species is the primary driver of geologic change and that this moment is potentially a major (negative) inflection point in the planetary story. EV is one of the primary causes and consequences of this moment. The global metabolism for material and energy shows no signs of abating [22–24] and the possibility of relying on decoupling consumption from material use and emissions shows no sign of materializing in a sufficient way to avoid ecological catastrophe [25–29]. To *drawdown* emissions and *regenerate* biotic and abiotic communities are likely the orders of the day [30, 31], and this volume proposes EV as a tool to help us get there.

The devastating impacts of toxic pollution alone, that is not taking into account the harm of human-produced non-toxic pollution namely climate change–driving greenhouse gas emissions, can hardly be overstated. Reliable estimates put the number of people who die each year as a result of toxic pollution at 7–9 million, at least [6, 32–35]. In comparison, approximately 90 000 people die annually due to armed conflict [36]. In total, there were about 1 million armed-conflict deaths between 2000 and 2017 and about 2.25 million between 1990 and 2017 [36, 37]. Globally, another 460 000 people perish annually via homicide [37]. The sum of armed conflict and homicide deaths is, thus, more than an order of magnitude less than the annual deaths attributable to human-produced toxic pollution. And, importantly, these toxic pollution early mortality estimates do not include deaths caused by climate change, which is driven by anthropogenic greenhouse gas emissions. Such deaths include those resulting from the increased frequency and intensity of extreme heat events which are now estimated to account for almost half of all heat-related deaths annually [38]. More than 90% of these toxic pollution deaths occur in low- and middle-income countries [6, 33]. Coincidingly, the distribution of the negative effects of climate change is also such that, on average, these same low- and middle-income countries face the greatest resulting hazards [6, 39]. Current estimates, albeit using conservative assumptions, are that at least 13 million deaths annually are due to an unhealthy environment and environmental hazards [40]. All of this despite these countries and people being least responsible for the greenhouse gas emissions creating anthropogenic climate change and the rampant consumption of materials and goods and their corresponding toxic pollution emissions from extraction to use to disposal [22–24, 41, 42]. Importantly, death, though salient, is only one form of loss and damage that extends from human-produced environmental hazards [43–47]. A full accounting of the effects of these hazards has as yet not been made despite the pervasive patterning of their insidious effects in the everyday lives of literally billions of people.

I.2 Contextualizing Environmental Violence

Previous uses of EV, and related terms, have been instructive, highlighting the social processes of environmental harm production and their outcomes. However, the use of EV has been inconsistent, general, broad, and insufficiently connected to human health and well-being to be an effective tool to track, measure, and ultimately impact human health outcomes and to shift corresponding environmental health policies and management [48]. We offer a definition and analytical model of EV that aims to substantively increase the ability of researchers, practitioners, and policy makers to identify and orient on a specific frame for EV and recognize it for what it is: violence to humans with substantive health outcomes. To that end,

we propose that EV be defined as direct and indirect harm experienced by humans due to excess toxic and non-toxic pollutants put into a local – and concurrently the global – ecosystem through human activities and processes. Our definition specifies and centers excess human-produced pollution as a violent environmental health hazard. Pollution is in excess when human flourishing has been maximized and its production does, or is not required to, meet a human need and instead, on net, causes more externalized human suffering than it serves to prevent.

Our definition and proposed framework recognize that EV arises as part of dynamic anthropogenic socio-ecological processes. EV's persistence is facilitated by structural and cultural violence contexts; it is mediated by human vulnerability, specifically a person's or community's exposure to it and capacity to deal with the impacts of toxic and non-toxic pollutants. EV exacerbates and creates harm and power differentials at individual, community, regional, and global scales. And, importantly, all of these components are connected, mutually shaping, and have potentially substantive impacts on health. Central to understanding and mapping EV, and thus a critical aspect that the framework draws out, is existing, multivalent inequalities: from the inequality in the production of EV through production and consumption and potential corresponding benefits [22, 24], to the inequality of its distribution and realized impacts and the corresponding inability to participate in the processes that mediate these outcomes [42, 49]. Addressing and amending inequality, in all forms, is essential to stopping ongoing, and remediating past, EV and creating the conditions for planetary and human flourishing [50].

The primary difference between our definition of EV and past concepts is our delimited focus on human-produced pollution as the vector of violence. This proposal is consistent with broadly used definitions of violence that describe it as "any avoidable insult to basic human needs; violence lowers the real level of needs satisfaction below what is potentially possible" [51, 52]. We do not ignore the political economy and other contexts around the production of EV or other ills, such as violent conflict or the experience of dispossession, connected to it. In fact, we directly account for them in our specification of the EV dynamics and process, and its constituent components and the feedbacks between them (see Figure I.1). But, in light of the fact that toxic and non-toxic pollution are the single largest global cause of early human mortality, morbidity, and myriad health hazards [6, 39, 42], honing in on human-produced pollution and its harms makes EV tractable, trans-scalar, and transportable without losing its analytical power and potential to contribute to promoting human, and inseparably planetary, health and flourishing.

We specify toxic pollution (e.g., the hazardous air pollutants particulate matter (PM2.5) or ozone(O_3)) and non-toxic pollution (e.g., the greenhouse gases carbon dioxide (CO_2) and methane (CH_4)) to capture diverse earth system processes that directly and indirectly pose risk and harm to human health [53, 54]. Our focus on

EV as it relates to human health is also supported by the structure of contemporary environmental policy. Most all pollution management laws are written to protect human health and the environment, placing primacy on human health [55–58]. This is also reflected in the UN declarations of access to a clean, healthy, and sustainable environment as a human right. However, we recognize and acknowledge that human flourishing is only maximized when planetary health is also flourishing, such that this nexus is an immutable and mutually reinforcing relationship. EV is for human and planetary health. This is also reflected in the growing call for the establishment of the rights of nature to progress to, or at least bring alongside, the construction of the human right to a healthy planet and the planetary right to health [3, 4].

Importantly, humans always have and likely always will produce pollution as a byproduct of meeting our needs. As we will make clear later, and this is the yet unresolved threshold determination of our definition, we argue that human-produced pollution transitions from necessary to violent after basic human needs have been met and optimized. By proposing our definition and framework, it is our hope that the conversation about EV progresses to focusing on this critical, specific but complex, determination to inform ongoing global environmental change discussions and everyday decision-making processes to work toward "a good life for all" within planetary boundaries [23, 29, 41].

I.2.1 Modeling Environmental Violence

EV is concomitantly a human health hazard – a vector of violence – and a process. To frame the dynamics of EV and provide an analytical tool that can be applied across varied contexts, we developed a heuristic model (Figure I.1) that outlines the constituent components of EV and the flow and interactions between the components.

I.2.2 Structural and Cultural Violence

Structural violence consists of formal policies or practices that lead to the unequal distribution of risk and benefits to different groups of people, often divided along lines of race, socioeconomic status, or other differentiators [59–62]. As applied to EV, we might think of a local or state environmental policy that allows for a factory to pollute (i.e., a permit to pollute) into an area where low-income people live as a structural violence that promotes EV. Cultural violence consists in the beliefs and norms that allow for other forms of violence to be so naturalized that they are not even thought of as violence or questioned as violent [63, 64]. Racism is a clear example of cultural violence at work [63, 65, 66]. As applied to EV,

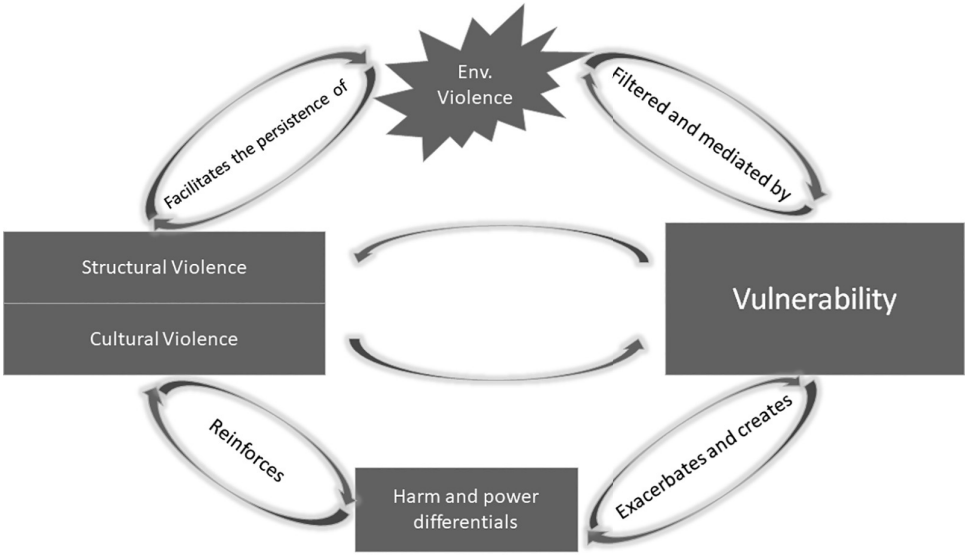

Figure I.1 Environmental violence framework

cultural violence may view as normative, and as taken for granted by society at large, the consumption of goods beyond what is needed for meeting human needs. Such cultural norms and exorbitant consumption perpetuate EV and the structural violences that allow for EV.

Together, structural and cultural violence facilitate the production and persistence of EV by normalizing and legalizing it. The harm and power differentials that EV causes can reduce, and further reinforce existing inequality in, the ability of marginalized persons and groups to work against EV.

I.2.3 Environmental Violence: The Vector of Violence

Human-produced pollution that is a hazard to human health is the vector of EV. The effects of toxic pollution alone are arguably one of the largest direct threats to global human health [32–35]. Toxic EV vectors are found in air, water, and soil with the air pollutant PM2.5 by far the leading hazard [33–35, 67]. Non-toxic vectors are predominantly, though not limited to, greenhouse gas emissions like carbon dioxide and methane that are driving global climate change resulting in hazards from deadly extreme weather events [68–75]. The global distribution of EV is predominantly in low- and middle-income countries while the consumption and other pollution producing practices and activities that are driving its production have been, and generally still are, predominantly in high-income countries and by wealthy individuals in all countries [33, 35, 42, 76]. This does not exempt any group from their potential participation in producing EV but is the general pattern

https://doi.org/10.1017/9781009417150.001 Published online by Cambridge University Press

and distribution of production. The EV vector results from both its actual production and also the consumption of the item produced – that is, consumers and producers are culpable for the EV emitted as they are part of the supply-demand chain.

EV, as modeled here, is increasing globally [6, 9, 17, 33–35, 69, 70, 77–79]. While most toxic pollution emissions are on average decreasing in high-income countries, they are increasing in low- and middle-income countries with corresponding increased rates of human health harm [6, 33, 35, 42]. Global climate change, driven by anthropogenic greenhouse gas emissions, and its corresponding degradation of human health are also increasing [70, 78–81]. Taking these pollution streams together and assessing them holistically but specifically is critical to effective environmental and health policy making [42, 82, 83].

I.2.4 Vulnerability

A person's or group's vulnerability mediates their exposure to EV and their ability to resist or adapt to it. Vulnerability is the "state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt" [84]. Vulnerability determines a person's human security, defined as the "… condition that exists when the vital core of human lives is protected, and when people have the freedom and capacity to live with dignity. In this assessment, the vital core of human lives includes the universal and culturally specific, material and non-material elements necessary for people to act on behalf of their interests" [85]. Contexts of structural and cultural violence shape a person's exposure to EV and other conditions of human security and vulnerability – such as their material capacity to protect themselves from an extreme weather event.

The magnitude of an EV hazard and the vulnerability of a person or group to that hazard interact and determine the ultimate effect of the hazard. For example, all people in a region experiencing an extreme heat wave may be similarly exposed to the hazard, but not all people may have the ability to depart the region or access air conditioning to reduce the negative health effects of their exposure. Similarly, people with pre-existing health conditions, including conditions such as asthma linked to toxic pollution exposure [86, 87], are often more vulnerable to EV. Paradoxically, the groups most responsible for EV – that is, predominantly wealthy nations and people – tend to be less vulnerable to EV resulting in an unequal distribution of harm and power differentials.

I.2.5 Harm and Power Differentials

The harms stemming from EV range from dementia and cognitive impairment [88–91] to mental health maladies [92–96] to mortality [33, 35, 67, 97, 98]. The

unequal distribution of these damages results in some groups, especially those already marginalized or materially lacking, being less able to effect change regarding the drivers and regulation of, and capacity to work against, EV [94, 99]. Thus, until the people with the power to effect change choose to do so, the EV process will continue to cycle and ratchet up as it is today. The cumulative effects of EV both over time and by overlapping effects – that is, multiple EV hazards occurring concurrently – further exacerbate and potentially multiply the effect of any individual EV hazard [6, 42, 82, 83, 100, 101].

I.2.6 Key Points and Limitations

EV, as a framework, offers several critical contributions. While not exhaustive, we find these insights most compelling. First, the framework leverages well developed concepts from the social sciences and explicitly integrates them with concepts and practices from environmental and public health science, policy, and management. Cohesively joining these robust frames draws together diverse points of approach and investigation making it transdisciplinary forward looking but grounded in established empirical and theoretical models.

Second, the structure of the framework is also such that it is replicable across varied contexts – geographical, social, political, cultural, regulatory, and so forth – and it is trans-scalar. The subcomponents of EV and their interconnections can be determined at all scales such that: (1) recurring patterns, such as those in a fractal system, emerge; (2) their influence and impacts can be mapped, if not functionally measured, to account for and understand them; and (3) then, hopefully, begin the critical work of reducing them. The trans-scalar and replicable properties of the framework – though notably not necessarily uniform application – of the framework across varied contexts promotes necessary comparatives of EV in the earth system facilitating exploring its varied processes of production, multivalent actions, and ultimate outcomes across space, time, and communities.

Third, the EV framework unifies what are often separated streams of environmental risk production: toxic and non-toxic pollution. These two groups of pollutants are often co-polluted: vehicle exhaust includes greenhouse gases like carbon dioxide and hazardous air pollution such as oxides of nitrogen (NOx) or particulate matter. Recognizing the interconnectedness of the production and outcomes of both pollution streams, the framework provides a more robust and comprehensive accounting of human-produced pollution and its collective, cumulative and interactive effects.

Fourth, and this is one of the key functions of this collection through demonstration, the EV framework recognizes a holistic complex of harm beyond a singular or dominant measure of loss and damage. Much of the impacts of EV cannot be

quantified in a way that is easily or readily translated into a cost–benefit analysis, the keystone process employed to weight the potential impacts of most environmental and public health policy and management decisions. Environmental violence is as experiential and phenomenological as it is generically empirical. Thus, the framework draws out these paths even where it cannot necessarily define the boundaries of the path through some numerical measure.

There are other direct contributions of the EV framework. Just as the list of potential contributions may be long, so is the list of current limitations. Many questions exist and their answers are needed to better define and operationalize EV as a tool. For example, at what point does human-produced pollution transition from meeting human needs and maximizing flourishing to EV? In other words, what defines "excess?" Should EV only include or be centered primarily on human health and flourishing as opposed to a broader specification for the inclusion of non-human species? Is EV an intentional act, and does intentionality matter for pollution to truly be considered violent? Or does knowledge of the pollution associated with excess consumption and its deleterious effects on human health constitute constructed or intrinsic intentionality, moving from information to intentionality [102] – that is, does being knowledgeable make you responsible even if you do not fundamentally *intend* to harm someone? Does the EV framework, as constructed, perpetuate or replicate forms of inequality and injustice, the very things it is intended to disrupt and deconstruct? It is these questions and more that are the primary onus for this collection. We do not promise to address them all, but rather we hope to further progress the conversation.

I.3 Why the Collection?

The implications of human-produced environmental harms for global health are complex, just as are their causes. As we have discussed, many frameworks have been deployed to conceptualize and analyze these patterns, with varying degrees of specificity, scope, and practical application. To accomplish the critical task of developing a broadly applicable but precisely determined understanding of EV, our collection brings together people – whether scholars, practitioners or a blend of both – from varied backgrounds, training, experiences, and modes of knowledge production to weave a multiperspectival tapestry of what EV is, what its implications and impacts are for different communities, how communities identify, engage with and work against it, and further developing and elaborating on the concept through critique and by putting it into conversation with other dominant concepts concerned with human and planetary flourishing. Our contributors include peacebuilders, engineers, economists, artists, theologians, anthropologists, and many other identities of scholarship and practice. Our contributors also range from early

career researchers with budding but rich agendas unfolding before them, to senior scholars and practitioners recognized as leading experts in their fields with stout contributions built and offered over years of exploration and engagement.

Emerging from the diversity of our contributors is a panoply of perspectives, experiences, expression, and engagement with EV. Our topics range from the intersection of Latin American Decolonial Thought and EV to pathways of sustainable fulfillment to move away from environmental violence to the poetics of environmental violence, with geographic and cultural representations from around the globe. By braiding these different approaches and knowledges our collection offers a robust transcendent accounting of environmental violence, a much-needed tool in the fight against this grave ailment to the human condition and planetary health.

The collection takes on and uses as a point of departure several key points of exploration left open or in need of refinement from previous work on EV [48, 53]. The first is the application and interrogation of the framework as initially constructed. And what does the application of the framework to empirical case studies show about what it can draw out – the trans-scalar patterns and characteristics across varied socio-ecological systems? How does EV articulate with other dominant concepts in this knowledge and practice of "sustainability" space, such as "green technology" and the renewable transition, the Sustainable Development Goals, and "degrowth?" And how can the framework be best calibrated and tweaked such that it does not occlude, replicate, or otherwise uphold the injustices and inequities it seeks to explore and account for? These and other themes are represented and unfold in the chapters of this collection.

This collection brings together a generative bricolage of peacebuilders, engineers, anthropologists, theologians, economists, and several others working around the globe from Inuit communities in the Arctic to mining communities in central Africa, to explore this most pressing challenge to humanity. Their engagement, application, critique, and refinement of EV is as varied as it is powerful.

The first part of our collection explores geographies of EV across the earth system through the realized outcomes and ongoing engagements of diverse human communities' ecosystems. These applications show the myriad ways EV manifests but also offers insights into the application, use, and potential limitations of the EV framework as an analytical tool. Pickett and O'Lear, unpacking body politics in the case of Chornobyl in northern Ukraine, emphasize the contingent, political processes of the production of scientific knowledge, and how those processes change understandings of both violence and the environment. They employ the 1986 Chornobyl disaster as a case study to illustrate the mutually constructive processes of politics and knowledge production and how understating that mutual dynamic reveals the ways in which the slow environmental harms of Chornobyl

were made visible. They accomplish this by using examples from the social monitoring program of the Department of Social Expertise in its tracking of the embodied EV among sufferers of the Chornobyl disaster. The particular geography and set of questions they explore is made only more intense and crucial given the ecological risks transpiring from the ongoing Russian war of aggression in Ukraine [103].

Further exploring the implications of EV in a human-constructed disaster context, McManus Warnell examines the communities and workers most impacted by acute climate disasters, within the context of business's role in human rights, stakeholder well-being, and resilience, featuring illustrative examples from Japan and the United States. McManus Warnell employs the EV framework to contexts as diverse as the triple disaster at Fukushima to the communities in the United States ravaged by wildfires, elucidating how workers rebuild our societies from EV while simultaneously exposed to it in the process. McManus Warnell explores how the role of business in climate change, argued to be simultaneously indicted as much of the problem's genesis and hailed as the source of innovative solutions, is clear and derives important insights about the causes and consequences of these EV scenarios.

Schoeppner explores EV in one of the, if not the, most vulnerable regions to the effects of climate change. Recounting how Inuit and Pacific Islanders have engaged in counter-mapping and counter-narrating their space that colonial powers have previously conceptualized as isolated, remote, and peripheral and how this is a practice of resistance to EV and its antecedent contexts of structural and cultural violence. Representing and speaking for a large geographic space consisting of land and water, both groups are utilizing these practices in climate change negotiations to address conditions causing EV and to move toward a reality of environmental peace.

Exploring the structural forces behind EV, Jaskoski explicates the regulatory requirement of "prior consultation" related to extractive industries in Latin America. In several Latin American countries, the state has to consult impacted Indigenous communities before approving new hydrocarbon and mining development. However, as Jaskoski demonstrates through case studies in Bolivia, Colombia, and Peru, this consultative process can be applied such that it frustrates its original intention of protecting Indigenous rights, acting instead as a mechanism of structural violence and lending itself to the expansion of EV production.

Working at the intersection of coloniality, nuclear contamination, and deemed disposable areas and populations, Schoenberger explores how the history of nuclear testing and redress efforts in French Polynesia, or as many Polynesians prefer to call it, Māʻohi Nui, can illustrate the descriptive, political, and legal challenges posed by environmental violence in the atomic age. Schoenberger explores

risk imposition in and of itself (even in the absence of provable, measurable harm) as a form of environmental violence of particular salience and demonstrates how EV in the context of nuclear testing cannot be understood as separate from colonial contexts and forms of colonial violence. Connecting with global nuclear legacies and contexts, Schoenberger lays out the implications and constraints on law and how the dynamics of risk, causal uncertainty, and insufficient data frustrate processes of victim compensation today.

The second part of this collection is centered on critical engagement of the EV framework and employing the EV framework to critically engage concepts that occupy a similar space. Damiano takes the EV framework and employs it to inspect and assess the idea of "sustainable development." Damiano's point of departure is that the concept of sustainable development, while aimed at improving both the human–Earth relationships and the relationships between humans, has problematic historical baggage: It is rooted in a Western idea of development, which is imbued in violence against various non-Western peoples and is perpetuating controversial takes on economic growth and appropriate technology. Through the EV framework Damiano discusses issues in the concept of Sustainable Development and its implementation, suggesting a shift to the pursuit of a different concept: sustainable life.

Further probing conceptions of sustainability, Mulrow et al. propose and explore the "affluence-technology connection" regarding appropriate technology and affluence options for not just a sustainable future, but an equitable and just future. They keenly layout how the deployment of alternative technologies alone does not address many of the structural and cultural factors involved in generating EV. Shifting from one mechanism to another, or one material to another, entails a shift in economic context, but guarantees nothing about whether this new context will be more equitable, or even ecologically responsible. Utilizing three empirical examples, Mulrow et al. challenge different technology-centered pathways to sustainability and reducing EV while also offering an example of a fusion of old and new. Their analysis and conclusions suggest that appropriate technology and appropriate affluence have a critical role to play in building a future without EV.

Peña takes on EV and its connections with Latin American Decolonial Thought (LDET). Peña's exploration of this nexus reveals critical knowledge-power strategies that illustrate four emphases among decolonial thought and, at the same time, the critical dimensions to understand EV sources. These insights highlight potential limitations but also strengths of the EV framework as it articulates with LDET, a vibrant canon of research that has much to offer in shaping a just and sustainable future. Critically, Peña explores nature as an essential ally in this process.

Through a decolonial degrowth approach, which is grounded in a feminist, labor-empowering perspective, Abazeri et al. argue that an ideology of growth is

not tenable, and that EV has much to gain by intentionally integrating these lenses. Doing so, which means explicitly including these sets of theory into the theoretical composition of the EV framework and subsequently utilizing them in application of the model, better calibrates EV as a tool to quantify the multiple forms of EV that take place as a result of capital accumulation. Abazeri et al. work to show that in so doing, EV as a framework can better confront the challenges that arise from other strategies often used to reduce human suffering from environmental hazards while encouraging an emphasis on the celebration of local customs, knowledge, and ingenuity.

Examining the recent acclaimed film *Don't Look Up*, Zenner explores how popularized manifestations of eco-crisis, apocalyptic climate allegories, and other similar narratives construct media representations of EV and their implications for our understanding of it. Drawing on ecocinemacriticism, literary ecocriticism, contemporary Indigenous studies, and social theory, Zenner assesses the presumptive Whiteness of vaunted mainstream ecocinema as a form of cultural narrative; the generally myopic coloniality of apocalypse narratives; and linkages to other forms of spectacle in an international polity dependent on neoliberal political economics and structures of extraction. Zenner thus provides critique of the construction and potential understandings of EV, while also questioning what the implications are for media representations of EV given the dynamics she unearths that are interwoven with legacies of colonialism and racism.

Shifting the medium of expression to the widely exalted poetry of Nobel Laureate Pablo Neruda, Astorquiza interrogates the EV framework, specifically the framing of culture and cultural violence. Astorquiza traces how far culture can, in its autonomy, reproduce the practices associated with EV by analyzing a canonical Latin American poetic discourse found in Neruda's poem *Alturas de Macchu Picchu*. Astorquiza, articulates through a deep analysis of *Alturas de Macchu Picchu*, which contains similar intrinsic characteristics, questions the potentially interpreted base and superstructure division of cultural violence (base) and EV as a vector of violence (superstructure). Through this process, Astorquiza points to the need to reconsider how culture, and our ways of understanding it, are part of the cycle in which our ways of production and consumption are incompatible with the stability of the environment and society.

The third part of the collection brings together theoretical and empirical accounts of EV impacts, responses, resistance, and alternatives. One impact of EV that has received substantial attention is that of human displacement. Chessler examines how EV impacts migration, and how this displacement feeds into broader cycles of violent political conflict. As Chessler describes, EV is the largest driver of human migration today, displacing more than 20 million people annually [104]. Consequently, understanding the EV–migration linkage is critical. Through

a systematized review of the existing research, Chessler seeks to clarify the state of knowledge on the environment-migration-conflict nexus, identify points of consensus and debate, and chart a path forward for future research.

Montevecchio explores the nexus of EV and mining, and corresponding responses. Montevecchio provides an account of how peacebuilding efforts, specifically ongoing Catholic peacebuilding praxis, are actively, globally engaged with EV emanating from mining. This case examines and lays out the unique aspects of Catholic peacebuilding and the Catholic church for working against EV in the context of mining. He draws out insights and points of learning that can benefit individuals and groups, no matter their identities, carrying out peacebuilding and EV reduction efforts, but especially those engaged with mining. As Montevecchio notes, because of the minerals necessary for the proposed renewable transition, the lessons provided are made all the more important given the challenges of mining without producing EV.

Just as the EV–mining nexus is a critical forefront intersection, so too is the EV–agriculture connection. Stock begins by explicating contemporary agricultural practices and their corresponding EV from a heavy reliance on synthetic chemicals to raise commodities, as well as fossil fuels for tractors and shipping related to distribution. Through the lens of Jacques Ellul's theory of a technological society and technique that values efficiency in all areas of life, Stock explores the relationship between EV, contemporary agricultural practices, and wider critiques of technology, and offers potential pathways forward in agriculture that can regenerate human and ecological communities.

Another human practice that has an intricate relationship with EV, though quite different than those of mining and agriculture, is art. Sohns captures how art has been both a witness to, and mechanism of response to, proliferating human-produced pollution and its associated violence on human health and well-being. Art can draw our attention to the polyvalent presence and impacts of EV while also offering a pathway of coping. Sohns encapsulates these valences of the art–EV nexus, mobilizing a sense of urgency and empowering multi-sensory understandings of the impacts of EV, while also providing an effective means of coping with and responding stoutly to EV.

Closing out the third section and collection contributions, Isham provides empirical evidence that, in our assessment, amounts to a basis for hope. Isham begins by reviewing the evidence to show that materialistic values support the production of EV while also being deleterious to human health and well-being through multiple other pathways. Isham, drawing on her empirical work in the field of positive psychology, then considers how flow experiences – that is, optimal human experience through a particular activity – can offer an antidote that would allow us to reduce EV and to live better and more sustainably. In doing so, Isham offers practical

recommendations for how to encourage flow experiences across society and in the process reduce EV.

I.4 Reading This Collection

Engaging environmental violence, this collection proffers exploration of a phenomenon that is deeply wounding to human and planetary flourishing. It accounts for various ways in which communities are responding, from violently to artistically to active resistance. It makes clear how accepted institutions can simultaneously construct vulnerability and facilitate the production of EV as a vector of violence. Importantly, it enables the analysis necessary to demonstrate effective alternatives to the potentially damning trajectory we are on. Thus, this is not a collection of despair but rather a demonstration of what *is* through the EV tool but also what *can be*: it is a provider of possibilities that lay before us. Environmental violence is a choice. This is both condemning and a source of hope. The collection is offered in the hopes of inspiring the necessary change – as complex as it is vast – to justly and equitably regenerate human and planetary flourishing.

References

[1] UN GA. The human right to a clean, healthy and sustainable environment [Internet]. New York, NY: United Nations General Assembly; Jul 2022 [cited Aug 20, 2022] p. 4. Available from: https://digitallibrary.un.org/record/3982508

[2] UN HRC. UNHRC Resolution recognising a Human Right to a Healthy Environment [Internet]. Geneva, Switzerland: UN Human Rights Council; 2021 [cited Jan 29, 2022] p. 9. Available from: https://gnhre.org/community/unhrc-resolution-recognising-a-human-right-to-a-healthy-environment/

[3] Ip EC. From the right to a healthy planet to the planetary right to health. *The Lancet Planetary Health*. Feb 1, 2023;7(2):e104–5.

[4] Chapron G, Epstein Y, López-Bao JV. A rights revolution for nature. *Science*. Mar 29, 2019;363(6434):1392–3.

[5] Knox JH. Constructing the human right to a healthy environment. *Annual Review of Law Social Science*. Oct 13, 2020;16(1):79–95.

[6] Fuller R, Landrigan PJ, Balakrishnan K, Bathan G, Bose-O'Reilly S, Brauer M, et al. Pollution and health: A progress update. *The Lancet Planetary Health*. May 17, 2022;S2542–5196(22):13.

[7] WHO. WHO global air quality guidelines: Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide [Internet]. Geneva: World Health Organization; 2021 [cited Sep 23, 2021]. 300 p. Available from: https://apps.who.int/iris/handle/10665/345329

[8] Rockström J, Steffen W, Noone K, Persson Å, Chapin FS, Lambin EF, et al. A safe operating space for humanity. *Nature*. Sep 2009;461(7263):472–5.

[9] Persson L, Carney Almroth BM, Collins CD, Cornell S, de Wit CA, Diamond ML, et al. Outside the safe operating space of the planetary boundary for novel entities.

Environmental Science and Technology [Internet]. Jan 18, 2022 [cited Jan 25, 2022]; Available from: https://doi.org/10.1021/acs.est.1c04158
[10] Costello A, Romanello M, Hartinger S, Gordon-Strachan G, Huq S, Gong P, et al. Climate change threatens our health and survival within decades. *The Lancet*. Jan 14, 2023;401(10371):85–7.
[11] World Bank. Life expectancy at birth, total (years) | Data [Internet]. Washington, DC: The World Bank; 2020 [cited Oct 14, 2021] p. 3. Available from: https://data.worldbank.org/indicator/SP.DYN.LE00.IN
[12] Vollset SE, Goren E, Yuan CW, Cao J, Smith AE, Hsiao T, et al. Fertility, mortality, migration, and population scenarios for 195 countries and territories from 2017 to 2100: A forecasting analysis for the Global Burden of Disease study. *The Lancet*. Oct 17, 2020;396(10258):1285–306.
[13] FAO. The State of Food Security and Nutrition in the World 2022 [Internet]. Rome, Italy: FAO; 2022 [cited Feb 20, 2023]. 260 p. Available from: www.fao.org/documents/card/en/c/cc0639en
[14] Ellis EC, Kaplan JO, Fuller DQ, Vavrus S, Goldewijk KK, Verburg PH. Used planet: A global history. *Proceedings of the National Academy of Sciences of the United States of America*. May 14, 2013;110(20):7978–85.
[15] Collier P. *The Plundered Planet: Why We Must – and How We Can – Manage Nature for Global Prosperity*. Oxford, England: Oxford University Press; 2010. 289 p.
[16] Steffen W, Crutzen PJ, McNeill JR. The Anthropocene: Are humans now overwhelming the great forces of nature. *AMBIO: A Journal of the Human Environment*. Dec, 2007;36(8):614–21.
[17] Steffen W, Broadgate W, Deutsch L, Gaffney O, Ludwig C. The trajectory of the Anthropocene: The great acceleration. *The Anthropocene Review*. 2015;2(1):81–98.
[18] Haraway D. Anthropocene, capitalocene, plantationocene, chthulucene: Making kin. *Environmental Humanities*. 2015;6(1):159–65.
[19] Kolbert E. *The Sixth Extinction: An Unnatural History*. New York, NY: Henry Holt and Company; 2014. 336 p.
[20]. Pyne SJ. *The Pyrocene: How We Created an Age of Fire, and What Happens Next*. Berkeley, CA: University of California Press; 2021. 191 p.
[21] Preston CJ. *The Synthetic Age: Outdesigning Evolution, Resurrecting Species, and Reengineering Our World*. Cambridge, MA: MIT Press; 2019. 223 p.
[22] Hickel J, O'Neill DW, Fanning AL, Zoomkawala H. National responsibility for ecological breakdown: A fair-shares assessment of resource use, 1970–2017. *The Lancet Planetary Health*. Apr 1, 2022;6(4):e342–9.
[23] Fanning AL, O'Neill DW, Hickel J, Roux N. The social shortfall and ecological overshoot of nations. *Nature Sustainability*. Jan, 2022;5(1):26–36.
[24] Hickel J. Quantifying national responsibility for climate breakdown: An equality-based attribution approach for carbon dioxide emissions in excess of the planetary boundary. *The Lancet Planetary Health*. Sep 2020;4(9):e399–404.
[25] D'Alessandro S, Cieplinski A, Distefano T, Dittmer K. Feasible alternatives to green growth. *Nature Sustainability*. Apr 2020;3(4):329–35.
[26] Hickel J, Kallis G. Is green growth possible? *New Political Economy*. Jun 6, 2020;25(4):469–86.
[27] O'Neill DW. Beyond green growth. *Nature Sustainability*. Apr 2020;3(4):260–1.
[28] Haberl H, Wiedenhofer D, Virág D, Kalt G, Plank B, Brockway P, et al. A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: Synthesizing the insights. *Environmental Research Letters*. Jun 2020;15(6):065003.

[29] Hickel J. Is it possible to achieve a good life for all within planetary boundaries? *Third World Quarterly*. Jan 2, 2019;40(1):18–35.
[30] Hawken P. *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. London, England: Penguin; 2017. 258 p.
[31] Hawken P. *Regeneration: Ending the Climate Crisis in One Generation*. Penguin; 2021. 700 p.
[32] Burnett R, Chen H, Szyszkowicz M, Fann N, Hubbell B, Pope CA, et al. Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter. *Proceedings of the National Academy of Sciences of the United States of America*. Sep 18, 2018;115(38):9592–7.
[33] Fuller R, Sandilya K, Hanrahan D. Pollution and health metrics [Internet]. New York, NY: Global Alliance on Health and Pollution; 2019 [cited Feb 18, 2020] p. 56. Available from: https://gahp.net/wp-content/uploads/2019/12/PollutionandHealthMetrics-final-12_18_2019.pdf
[34] Vohra K, Vodonos A, Schwartz J, Marais EA, Sulprizio MP, Mickley LJ. Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem. *Environmental Research*. Apr 1, 2021;195:110754.
[35] Landrigan PJ, Fuller R, Acosta NJR, Adeyi O, Arnold R, Basu N (Nil), et al. The Lancet commission on pollution and health. *The Lancet*. 2017;391 (10119):462–512.
[36] UN. Shaping our future together [Internet]. Geneva, Switzerland: United Nations; 2020 [cited Nov 9, 2022] p. 3. Available from: www.un.org/sites/un2.un.org/files/2020/01/un75_conflict_violence.pdf
[37] UNODC. Global study on homicide [Internet]. Vienna, Austria: United Nations Office on Drugs and Homicide; 2019 [cited Nov 9, 2022]. Available from: www.unodc.org/documents/data-and-analysis/gsh/Booklet1.pdf
[38] Vicedo-Cabrera AM, Scovronick N, Sera F, Royé D, Schneider R, Tobias A, et al. The burden of heat-related mortality attributable to recent human-induced climate change. *Nature Climate Change*. Jun 2021;11(6):492–500.
[39] Romanello M, Napoli CD, Drummond P, Green C, Kennard H, Lampard P, et al. The 2022 report of the Lancet Countdown on health and climate change: Health at the mercy of fossil fuels. *The Lancet* [Internet]. Oct 25, 2022 [cited Oct 26, 2022];0(0). Available from: www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01540-9/fulltext
[40] Prüss-Ustün A, Wolf J, Corvalán C, Bos R, Neira M. *Preventing Disease Through Healthy Environments*. Geneva, Switzerland: World Health Organization; 2016 p. 176.
[41] O'Neill DW, Fanning AL, Lamb WF, Steinberger JK. A good life for all within planetary boundaries. *Nature Sustainability*. Feb 2018;1(2):88–95.
[42] Marcantonio R, Javeline D, Field S, Fuentes A. Global distribution and coincidence of pollution, climate impacts, and health risk in the Anthropocene. *PLOS ONE*. Jul 21, 2021;16(7):e0254060.
[43] Boyd E, James RA, Jones RG, Young HR, Otto FEL. A typology of loss and damage perspectives. *Nature Climate Change*. Sep 25, 2017;7(10):723–9.
[44] Calliari E, Serdeczny O, Vanhala L. Making sense of the politics in the climate change loss & damage debate. *Global Environmental Change*. Sep 1, 2020;64:102133.
[45] Huq S, Roberts E, Fenton A. Loss and damage. *Nature Climate Change*. Nov, 2013;3(11):947–9.
[46] Geest K van der, Warner K. Loss and damage in the IPCC fifth assessment report (Working Group II): A text-mining analysis. *Climate Policy*. Jul 2, 2020;20(6):729–42.
[47] Preston CJ. Challenges and opportunities for understanding non-economic loss and damage. *Ethics, Policy & Environment*. May 4, 2017;20(2):143–55.

[48] Marcantonio R, Fuentes A. Environmental violence: A tool for planetary health research [Internet]. Rochester, NY: Social Science Research Network; Jul 2021 [cited Apr 1, 2022]. Report No. ID 3986264. Available from: https://papers.ssrn.com/abstract=3986264
[49] Martinez-Alier J. Mapping ecological distribution conflicts: The EJAtlas. *The Extractive Industries and Society*. Dec 1, 2021;8(4):100883.
[50] Millward-Hopkins J, Oswald Y. Reducing global inequality to secure human well-being and climate safety: A modelling study. *The Lancet Planetary Health*. Feb 1, 2023;7(2):e147–54.
[51] Galtung J. A structural theory of aggression. *Journal of Peace Research*. Jun 1964;1(2):95–119.
[52] Galtung J. Violence, peace, and peace research. *Journal of Peace Research*. 1969;6(3):167–91.
[53] Marcantonio R. Environmental violence. In *The Earth System and the Human Niche* [Internet]. Cambridge: Cambridge University Press; 2022 [cited Jul 15, 2022]. Available from: www.cambridge.org/core/books/environmental-violence/30437FC2F540C830A23D9B0ECD93B560
[54] Lame M, Marcantonio R. *Environmental Management: Concepts and Practical Skills*. 1st ed. Cambridge, UK: Cambridge University Press; 2022.
[55] O'Leary R, Durant RF, Fiorino DJ, Wieland PS. *Managing for the Environment: Understanding the Legal, Organizational, and Policy Challenges*. 1st ed. San Francisco: Jossey-Bass; 1999. 472 p.
[56] Barnes AJ, Graham JD, Konisky DM. *Fifty Years at the US Environmental Protection Agency: Progress, Retrenchment, and Opportunities*. Lanham, MD: Rowman & Littlefield; 2021. 671 p.
[57] Kraft ME. *Environmental Policy and Politics*. Oxfordshire, UK: Taylor & Francis; 2017. 421 p.
[58] Barrett S. *Environment and Statecraft: The Strategy of Environmental Treaty-Making*. Oxford, England: Oxford University Press; 2003. 460 p.
[59] Farmer P. An Anthropology of structural violence. *Current Anthropology*. Jun 2004;45(3):305–25.
[60] Farmer P. *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Berkeley, CA: University of California Press; 2003. 429 p.
[61] Galtung J, Höivik T. Structural and direct violence: A note on operationalization. *Journal of Peace Research*. 1971;8(1):73–6.
[62] Wiegert K. Structural violence. In Fink G, editor. *Stress of War, Conflict and Disaster*. Oxford: Academic Press; 2010. pp. 126–33.
[63] Galtung J. Cultural violence. *Journal of Peace Research*. 1990;27(3):291–305.
[64] Ricigliano R. Making Peace Last: A Toolbox for Sustainable Peacebuilding [Internet]. Routledge; 2015 [cited Aug 20, 2019]. Available from: www.taylorfrancis.com/books/9781315633565
[65] Springs JA. Structural and Cultural Violence in Religion and Peacebuilding. In: Omer, A and Appleby, S, editors. *The Oxford Handbook of Religion, Conflict, and Peacebuilding*. Oxford University Press; 2015. p. 146.
[66] Taylor JY. No resting place: African American women at the crossroads of violence. *Violence Against Women*. Dec 1, 2005;11(12):1473–89.
[67] Pope A, Lefler Jacob S, Ezzati Majid, Higbee Joshua D, Marshall Julian D, Kim Sun-Young, et al. Mortality risk and fine particulate air pollution in a large, representative cohort of U.S. adults. *Environmental Health Perspectives*. 2020;127(7):077007.

[68] Mora C, Dousset B, Caldwell IR, Powell FE, Geronimo RC, Bielecki CR, et al. Global risk of deadly heat. *Nature Climate Change*. Jul 2017;7(7):501–6.
[69] IPCC. Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Geneva, Switzerland: International Panel on Climate Change; 2019. 43 p.
[70] IPCC. Summary for Policy Makers. In Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways. Geneva, Switzerland: World Meteorological Organization; 2018. 32 p.
[71] Raymond C, Matthews T, Horton RM. The emergence of heat and humidity too severe for human tolerance. *Science Advances*. May 1, 2020;6(19):eaaw1838.
[72] Raymond C, Horton RM, Zscheischler J, Martius O, AghaKouchak A, Balch J, et al. Understanding and managing connected extreme events. *Nature Climate Change*. Jul 2020;10(7):611–21.
[73] Bhatia KT, Vecchi GA, Knutson TR, Murakami H, Kossin J, Dixon KW, et al. Recent increases in tropical cyclone intensification rates. *Nature Communications*. Feb 7, 2019;10(1):1–9.
[74] Kulp SA, Strauss BH. New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. *Nature Communications*. Oct 29, 2019;10(1):1–12.
[75] Storlazzi CD, Gingerich SB, Dongeren A van, Cheriton OM, Swarzenski PW, Quataert E, et al. Most atolls will be uninhabitable by the mid-21st century because of sea-level rise exacerbating wave-driven flooding. *Science Advances*. Apr 1, 2018;4(4):eaap9741.
[76] UNEP. The emissions gap report 2020 [Internet]. Nairobi, Kenya: United Nations Environmental Program; 2020 [cited Dec 17, 2020] p. 128. Available from: www.unep.org/emissions-gap-report-2020
[77]. Steffen W, Rockström J, Richardson K, Lenton TM, Folke C, Liverman D, et al. Trajectories of the Earth system in the Anthropocene. *Proceedings of the National Academy of Sciences of the United States of America*. Aug 1, 2018;201810141.
[78] Romanello M, McGushin A, Napoli CD, Drummond P, Hughes N, Jamart L, et al. The 2021 report of the Lancet Countdown on health and climate change: Code red for a healthy future. *The Lancet*. Oct 20, 2021;0(0):44.
[79] Watts N, Amann M, Arnell N, Ayeb-Karlsson S, Belesova K, Boykoff M, et al. The 2019 report of The Lancet Countdown on health and climate change: Ensuring that the health of a child born today is not defined by a changing climate. *The Lancet*. Nov 16, 2019;394(10211):1836–78.
[80] Swain DL, Singh D, Touma D, Diffenbaugh NS. Attributing extreme events to climate change: A new frontier in a warming world. *One Earth*. Jun 19, 2020;2(6):522–7.
[81] Springmann M, Mason-D'Croz D, Robinson S, Garnett T, Godfray HCJ, Gollin D, et al. Global and regional health effects of future food production under climate change: A modelling study. *The Lancet*. May 7, 2016;387(10031):1937–46.
[82] Landrigan PJ, Fuller R, Haines A, Watts N, McCarthy G. Pollution prevention and climate change mitigation: Measuring the health benefits of comprehensive interventions. *The Lancet Planetary Health*. Dec 1, 2018;2(12):e515–6.
[83] GAHP. Air pollution interventions: Seeking the intersection between climate and health [Internet]. New York: Global Alliance on Health and Pollution; 2020 [cited

May 12, 2021] p. 85. Available from: https://gahp.net/wp-content/uploads/2020/06/AirPollutionReport2-compressed-1.pdf
[84] Adger N. Vulnerability. *Global Environmental Change*. Aug 2006;16(3):268–81.
[85] Barnett J, Adger N. Climate change, human security and violent conflict. *Political Geography*. Aug 2007;26(6):639–55.
[86] Clark NA, Demers PA, Karr CJ, Koehoorn M, Lencar C, Tamburic L, et al. Effect of early life exposure to air pollution on development of childhood asthma. *Environmental Health Perspectives*. Feb 1, 2010;118(2):284–90.
[87] Gehring U, Wijga AH, Hoek G, Bellander T, Berdel D, Brüske I, et al. Exposure to air pollution and development of asthma and rhinoconjunctivitis throughout childhood and adolescence: A population-based birth cohort study. *The Lancet Respiratory Medicine*. Dec 1, 2015;3(12):933–42.
[88] Calderón-Garcidueñas L, Gónzalez-Maciel A, Reynoso-Robles R, Delgado-Chávez R, Mukherjee PS, Kulesza RJ, et al. Hallmarks of Alzheimer disease are evolving relentlessly in Metropolitan Mexico City infants, children and young adults. APOE4 carriers have higher suicide risk and higher odds of reaching NFT stage V at ≤ 40 years of age. *Environmental Research*. Jul 1, 2018;164:475–87.
[89] Chen H, Kwong JC, Copes R, Tu K, Villeneuve PJ, Donkelaar A van, et al. Living near major roads and the incidence of dementia, Parkinson's disease, and multiple sclerosis: A population-based cohort study. *The Lancet*. Feb 18, 2017;389(10070):718–26.
[90] Carey IM, Anderson HR, Atkinson RW, Beevers SD, Cook DG, Strachan DP, et al. Are noise and air pollution related to the incidence of dementia? A cohort study in London, England. *BMJ Open*. Sep 1, 2018;8(9):e022404.
[91] Wu YC, Lin YC, Yu HL, Chen JH, Chen TF, Sun Y, et al. Association between air pollutants and dementia risk in the elderly. *Alzheimers Dement (Amst)*. May 14, 2015;1(2):220–8.
[92] Bourque F, Willox A. Climate change: The next challenge for public mental health? *International Review of Psychiatry*. Aug 2014;26(4):415–22.
[93] Shultz JM, Kossin JP, Shepherd JM, Ransdell JM, Walshe R, Kelman I, et al. Risks, health consequences, and response challenges for Small-Island-based populations: Observations from the 2017 Atlantic Hurricane Season. *Disaster Medicine and Public Health Preparedness*. Feb 2019;13(1):5–17.
[94] Shultz JM, Sands DE, Kossin JP, Galea S. Double environmental injustice – Climate change, Hurricane Dorian, and the Bahamas. *New England Journal of Medicine*. Jan 2, 2020;382(1):1–3.
[95] Espinel Z, Galea S, Kossin JP, Caban-Aleman C, Shultz JM. Climate-driven Atlantic hurricanes pose rising threats for psychopathology. *The Lancet Psychiatry*. Sep 1, 2019;6(9):721–3.
[96] Espinel Z, Kossin JP, Galea S, Richardson AS, Shultz JM. Forecast: Increasing mental health consequences from Atlantic Hurricanes throughout the 21st century. *Psychiatric Services*. Aug 12, 2019;70(12):1165–7.
[97] Ebi K, Ogden NH, Semenza JC, Woodward A. Detecting and attributing health burdens to climate change. *Environmental Health Perspectives*. 2017;125(8):085004.
[98] Hales S, Kovats S, Lloyd S, Campbell-Lendrum D. *Quantitative Risk Assessment of the Effects of Climate Change on Selected Causes of Death, 2030s and 2050s*. Geneva, Switzerland: World Health Organization; 2014 p. 128.
[99] Tschakert P, Ellis NR, Anderson C, Kelly A, Obeng J. One thousand ways to experience loss: A systematic analysis of climate-related intangible harm from around the world. *Global Environmental Change*. Mar 1, 2019;55:58–72.

[100] Mora C, Spirandelli D, Franklin EC, Lynham J, Kantar MB, Miles W, et al. Broad threat to humanity from cumulative climate hazards intensified by greenhouse gas emissions. *Nature Climate Change*. Dec 2018;8(12):1062–71.
[101] Reis LA, Drouet L, Tavoni M. Internalising health-economic impacts of air pollution into climate policy: A global modelling study. *The Lancet Planetary Health*. Jan 1, 2022;6(1):e40–8.
[102] Loewer B. From information to intentionality. *Synthese*. 1987;70(2):287–317.
[103] Hook K, Marcantonio R. Environmental dimensions of conflict and paralyzed responses: The ongoing case of Ukraine and future implications for urban warfare. *Small Wars & Insurgencies*. Feb 13, 2022;0(0):1–29.
[104] IEP. Ecological threat register 2020: Understanding ecological threats, resilience and peace [Internet]. Sydney, Australia: Institute for Economics and Peace; 2020 [cited Sep 11, 2020] p. 95. Available from: http://visionofhumanity.org/app/uploads/2020/09/ETR_2020_web-1.pdf