Revista Română de Filosofie Analitică,
Romanian Journal of Analytic Philosophy
Vol. XVI, Iulie-Decembrie 2022, Nr. 2, p. 143-170
ISSN (ediția electronică): 1843-9969,
ISSN (ediția tipărită): 1844-2218
DOI: 10.62229/rrfaxvi-2/7

# ESSENTIALISM AND ENVIRONMENTAL CRISIS: AN INEVITABLE (RE)INTRODUCTION

**MICAH THOMAS PIMARO, JR.**[1]

***Abstract*:** Recent conversations in environmental studies tilt towards the imperative for local knowledge systems. This knowledge is often held by non-experts and outside formal institutional settings. Lived experiences offer alternative perspectives on environmental crises. The challenge, however, remains: how might alternate knowledge be integrated into broader environmental action conversations? In response, metaphysical coherentism, according to which reality consists of a network of independent elements, where every component is grounded in relation to others, is proposed. Such grounding could accommodate the plurality of perspectives that are inherent in the environmental crisis and address the top-down approach in policy frameworks. Metaphysical coherentism argues that greater clarity is needed in the ontological categories of environmental studies.

***Keywords***: essentialism, environmental crisis, alternate knowledge, metaphysical coherentism, epistemological pluralism

## 1. Introduction

The current environmental crisis, as marked by a 90% rise in $CO_2$ emissions since 1970, and the ambitious need for reducing the current warming to 1.5 degrees Celsius, demands new ways of thinking and

[1] Micah Thomas Pimaro, Jr. is a lecturer in Philosophy at the University of Calabar, Nigeria, and doctoral student within the Faculty of Philosophy at the University of Bucharest.

approaches to collective action (Maurya et al., 2020; Burelli & Pala, 2021). While global climate agreements such as the Paris Agreement emphasize the imperative of collective actions, they are often called for in situations where there is high awareness of a problem but there are no meaningful actions, overlooking the local, non-expert knowledge that is held by communities most affected by climate change. This exclusion increases inequalities and could limit effective solutions. But how can we integrate alternate knowledge or different perspectives into broader environmental action conversations? By appealing to metaphysical coherentism, a framework according to which reality consists of a network of independent elements, where every component is grounded in relation to others, I offer a way to embrace alternate knowledge and promote inclusive action.

Globally, different communities are increasingly being affected by the impact of the triple planetary crisis unequally, either in areas where resources are scarce or where there are poor governance mechanisms or capacity; in all these instances, people do face environmental degradation simultaneously along with systemic inequality, especially pertaining to how these challenges are addressed (Abbass et al., 2022; UNDP, 2023). Even when research has shown that air and water pollution can harm people both physically and mentally, especially in those communities that live in industrial zones that are at the same time economically disadvantaged and politically marginalised (Pratt et al., 2015; Mansalidis et al., 2020; Siddiqua et al., 2022; EEA, 2022), the questions of responsibility, justice and collective actions remained contested (Ranniger, 2020; Aneesh et al., 2020; Carlo and Davide, 2021).

The 1997 Kyoto Protocol attempted to tackle such a challenge by introducing the concept of accountability in cutting down emissions; however, poorer nations are still carrying the burden of environmental degradation as well as the mental and health consequences that come with that (Babiker et al., 2000; Kronlid, 2003; Birkmann et al., 2022; Rentschler and Nadezda, 2023). The implication of such tendencies remains that the effectiveness of the Kyoto Protocol is interrupted by minimal participation and implementation mechanisms, as recorded in the UN Treaty Collection (1998) and reiterated by Barrett (1998). In 2016, the Paris Agreement was adopted with a broader view to ensure that

nations reduce their emissions based on the principle of "common but differentiated responsibilities and respective capabilities" as a means of balancing equity with collective action (Falkner, 2016; Annalisa, 2016; Kennedy and Pauw, 2016).

A growing consciousness and concern arose from such analysis on climate justice. Since climate change and other environmental issues affects us unequally, its burdens and benefits should be fairly shared (Schlosberg and Collins, 2014). This is a top-down solution, strategies being designed by central authorities. Such strategies could lead to the "crisis of paralysis", where people know what is wrong, but existing policies are inadequate and unable to engage people who are most affected by the crisis (Zvobgo et al. 2022). This makes the call for the integration of local knowledge a necessity. Local knowledge simply is the lived experiences of communities or knowledge they have held on to from time immemorial as they interact with their local ecosystems, also including how they have adapted to change and protected their environments; these are in general regarded as non-expert knowledge (IPBES, 2019; Mustonen, 2021; IPCC, 2022; Mustonen et al., 2022). According to the IPCC report as recorded by Portner et al. (2021), the triple planetary crisis encompassing climate change, pollution and biodiversity loss requires new ways of reasoning and inclusive approaches that should reflect the complexity of human societies and nature. This would imply the need for integrating community views in making climate policy relevant, just, equitable and workable (Turner et al., 2022).

Nevertheless, the challenge to this proposal would remain how to identify, legitimize and include laypeople's knowledge or non-expert knowledge and what role that can play in shaping broader environmental action. But since human beliefs are interrelated and could gain meaning contextually, metaphysical coherentism might champion the necessity of not stripping away complexity inherent in the adoption of local knowledge but clarify why diverse views should be embraced to make space for understanding people living through the environmental crisis; a shift that could aid in reimagining environmental governance as well as a shared understanding of collective action (Swiderski, 2024).

## 2. Dominant Epistemologies in Environmental Crisis

This section sets out to clarify the way our understanding and responses to environmental crises are shaped by dominant epistemologies. By dominant epistemologies, I mean knowledge systems that uphold certain ways of seeing and explaining the crisis that marginalize other people, even if unintendedly. Such approaches might offer vital insights into environmental issues. However, in so far as they are unable to account for, and ignore, the lived experiences of people most affected by these crises, dominant epistemologies could limit the effectiveness of environmental policies in such regions. The global environmental crisis characterized by the triple planetary crisis calls for a comprehensive understanding and response, but the dominant epistemologies, particularly those rooted in positivism, scientism, and neoliberalism, have profoundly influenced how such crises are understood and, by extension, addressed, especially by key international bodies such as the IPCC and the UNFCCC.

Positivism has been central to the methodologies of the IPCC and other scientific and policy bodies. IPCC's reports are based on rigorous empirical research and data-driven models that provide crucial insights into the causes and consequences of environmental degradation. Even though such an approach must have contributed in terms of raising environmental consciousness at international forums like the COP, it has its drawbacks, especially as the reliance on quantitative data often marginalizes qualitative insights such as indigenous knowledge systems, which offer valuable perspectives on environmental management and sustainability. More so, the emphasis on scientific consensus can sometimes obscure the ethical and social dimensions of environmental management issues. For instance, while the IPCC provides projections and scenarios, it does not address the questions of inequalities, justice and collective actions that are before us (Barnett et al., 2008).

The scientist *credo* that scientific and technical expertise can solve all problems has significantly influenced environmental policy making. The IPCC sometimes proposes technocratic solutions commonly found in concerns about renewable energy technologies. While these technological innovations are essential, the science underlying their promotion can lead

to an overreliance on technology at the expense of broader socio-political and ethical reforms. Take, for instance, the Paris Agreement, facilitated by the UNFCCC, which heavily emphasizes technological solutions to meet emissions reduction targets, often without sufficient consideration of the underlying socio-economic systems that drive environmental degradation (Tosun and Peters, 2021).

Neoliberalism, as a dominant epistemology in environmental conservation, advocates for market-driven solutions, particularly within the framework of the UNFCCC and other international environmental pacts. This strategy produced the Kyoto Protocol, "the Clean Development Mechanism", its sister market mechanism, and "carbon trading", which all seek to lower greenhouse gas emissions by providing financial incentives for doing so. However, this kind of neoliberalism has put economic efficiency ahead of environmental justice and social equity. Even though market-based solutions frequently help wealthier countries and businesses, impoverished communities, especially those in the global south, bear the burden of environmental damage (Bond, 2012).

This is why Lohmann (2006) maintained that the commodification of nature through mechanisms like carbon credits can lead to the exploitation of natural resources and ecosystems, thereby undermining long-term sustainability.

From the foregoing, there is a growing recognition of the need for epistemological pluralism, according to which there is not just a single way of understanding and tackling environmental crises but multiple and legitimate means of producing and understanding environmental crises/knowledge. This could help in addressing both the current environmental crisis and the need for integrating diverse knowledge systems, ethical considerations, and socio-political perspectives into environmental governance. Such a position is informed by the fact that international agencies like the IPCC and UNFCCC have so far begun to acknowledge that perspective, as shown by the recent reports that emphasize the importance of equity, justice, and inclusion in climate action (IPCC, 2022). Also, the Global Environmental Outlook reports by the UNEP (2023) have highlighted the need for transformative change that goes beyond technical fixes and market mechanisms, advocating for systemic shifts in governance, economic models, and societal values.

## 3. The impact of dominant epistemologies on environmental crisis

I argue that positivism's focus on scientific objectivity and data-driven approaches can exclude and devalue knowledge systems that are not easily quantified and unable to fit into dominant paradigms. Furthermore, scientism and technocratic bias extend such tendencies. Promoting the beliefs that science and technical expertise alone can solve environmental problems leads to top-down, expert-driven solutions while sidelining the experiential knowledge of local communities that live with and understand their environments intimately. In the same vein, the neoliberal commodification of nature contributes to sidelining alternate knowledge by constantly framing environmental issues through the lens of market efficiency.

The implications of the positions above are numerous. Dominant epistemologies often provide a narrow and incomplete understanding of environmental issues, leading to a lack of awareness of critical ecological relationships and sustainable practices that have been developed over millennia (Kimmerer, 2013). Dominant epistemologies also contribute to the erosion of cultural and biological diversity by undermining the intricacy of non-expert knowledge of specific ecosystems, with cultural practices and languages, as biodiversity coevolves over time (Maffi, 2001). And dominant epistemologies create barriers to achieving sustainability and environmental justice by sidelining alternate knowledge systems, leading to loss of just and more sustainable environmental governance (Martinez-Alier, 2002).

## 4. Revisiting frontiers for environmental resilience

To improve community resilience, adaptability, sustainability, and disaster preparedness, all of which are primarily context-based, local knowledge and science must work together (Petzold et al. 2020; Reed *et al.* 2023).

However, attempts to combine local knowledge with Western scientific knowledge are frequently ineffective due to researchers'

inadequate understanding of local knowledge, which implies the need for participatory research in the environmental decision-making process (Parsons *et al.* 2017). Leah et al. (2022) contend that indigenous knowledge may include reciprocity in the process of responding to social concerns because they perceive themselves as a part of a genealogical network of interconnected entities and collectives that owe each other reciprocal duties.

A deeper appreciation and respect for local knowledge is often required in order to accurately record and elaborate on their beliefs and ways of life (Chapman and Schott, 2020). Indigenous conceptions of sustainability and well-being, and their incorporation as guiding principles in research and policy, may offer a more inclusive forum for stimulating discussions on goals and outcomes (Parsons *et al.*, 2017). For instance, witness reports can help track and interpret specific changes and effects, as they may not be accessible through scientific technologies (Redvers *et al.*, 2023). This is a situation where native stakeholders' explanations of events, processes, and rates of change could give crucial hypotheses because they take into account contextual aspects that outside researchers are deliberately avoiding or are unaware of (Mustonen *et al*., 2022). To better integrate such views with global assessments of climate change, it is vital to investigate potential complementarities with indigenous and scientific knowledge systems. Accordingly, we must identify patterns of environmental deterioration in regions with limited instrumental data and offer a thorough picture of the consequences of such a crisis. Local knowledge can supply additional data, data that are lacking from many other environmental solutions. (Naess, 2013; Reyes-Garcial et al., 2024).

Failure to understand the accounts of the most vulnerable in the areas impacted may lead to delays in delivering solutions to the environmental crisis (Val, 2002; Kronlid, 2003; Mallory, 2010). Communities should be empowered to speak for themselves. Outside experts can conduct themselves with ethical and epistemological humility, listening to the residents and offering their knowledge to the communities themselves in order to apply and deploy as they fashion their response on their own terms (Kronlid, 2003; Rigby, 2007; Mallory, 2010). Instead, on top of the impact of climate change, the local population often witnesses

contempt for their traditional socioecological resilience system models (Hosen *et al.*, 2020).

It is clear that local knowledge is significant because it has aided in the implementation of eco-decisions and the detection of regular sequences and sociocultural aspects which relate to the ways of life of the local people. Research has in recent times begun to shift towards investigating how community and individual perceptions of climate change provide important information regarding the behavioural dynamics of individuals responding to environmental crises as well as their ability to adjust to new conditions. This is a useful paradigm that, when applied locally, can be more accurate and dependable than scientific knowledge, since communities depend on it to help them deal with the day-to-day difficulties presented by natural processes and aberrations (Whitmarsh and Lorenzoni, 2010). In such cases, knowledge should be sociopolitical, according to Keller et al. (2022) and Reyes-Garcia et al. (2024), respectively. It is crucial to recognize that science shouldn't be made more neutral but rather address issues with the creation, acceptance, and validation of local knowledge in the environmental crisis and how that interacts with power dynamics.

Adopting an indigenous realism which acknowledges the authenticity and depth of indigenous world views and epistemologies could be helpful despite its oversight on historically marginalised practice (Dan, 2020). Indigenous realism is a systematic technique that can pinpoint historical and modern elements that raise the possibility of an environmental crisis by challenging the idea that colonialism is to blame instead. It could concentrate on Indigenous peoples' complex histories of displacement and the impact of invasive practices on their knowledge and way of life, which are strongly tied to the environment.

## 5. Alternate knowledge for holistic environmental solutions

This section intends to clarify what alternate knowledge means in an environmental crisis. In order to achieve that, concern regarding understanding how traditional ecological knowledge, also regarded as

alternate knowledge is addressed, especially where such knowledge is often grounded in experiential interactions with the environment as opposed to scientific knowledge derived from controlled experiments and empirical observations. How can such a view be used to foster environmental solutions? This argument makes the case that in order to produce more context-specific insights and practical environmental solutions, we must start taking into account the social, cultural, and political aspects of scientific knowledge generation through partnerships and compromises.

One of the questions that such a claim may raise is whether alternative knowledge is value-neutral. In that regard, attempt is made not to fully dig deep into such debate but to show that since value-neutral concern revolves around the imperative to set aside personal values and beliefs to avoid prejudice and to guarantee that rational conclusions take precedence over mere conjecture, it is maintained that concerns about the value-neutrality of knowledge can lead to the adoption of a standpoint epistemology, according to which we acknowledge the situatedness of knowledge and the need to consider diverse perspectives and interests in scientific inquiry and will help us to comprehend the plausibility of reality and the underlying worldviews about knowledge and action in connection to the climate crisis.

These days, ecological degradation and the poverty of hundreds of millions of people are acknowledged as unavoidable outcomes of progress, and the urgent actions required to prevent the eventual destruction of the conditions necessary for humankind to survive seem like a distant goal (Chu and Karr, 2017). In reality, environmental challenges are always viewed as incidental to more pressing problems, which should not be the case (Gare, 1996). Environmental movements need to be reconstructed to address concepts and ways of thinking that genuinely inspire people to take action and foster these kinds of attitudes. Whether such attitudes are best conceived as theoretical, as oriented toward natural kinds or as fundamentally cultural depends on the perspective and conceptual repertoire one brings to bear upon the analysis undertaken (for discussion, cf. Dumitru, 2004). Understanding the concepts and images ingrained in the daily activities of individuals,

along with those in the main societal institutions and their modes of existence, is still essential to comprehending how they interact with their environment. Environmental holism, for instance, emphasizes the interdependence of all components of an ecosystem, including human societies (Behrens, 2010). If this perspective is adopted, indigenous wisdom and local knowledge derived from customary practices, for instance, can be recognized as essential elements of ecosystem management (Brunner and Urenje, 2012; Mazzocchi, 2020).

Nevertheless, as individuals and communities build lasting relationships with profound insights regarding sustainable lifestyle choices, biodiversity preservation, and ecosystem restoration that enhance local knowledge systems and, by implication, prioritize ecological harmony and land preservation, an alternate knowledge claim may be validated and strengthened on such a basis (Dawson *et al.,* 2021). According to proponents of deep ecology, it may be easier to share information and jointly create solutions that respect ecological integrity and cultural diversity if local communities and other stakeholders are encouraged to form partnerships (Akamani, 2020). That will ensure sustainable management of natural resources with indigenous knowledge systems and practices and help to foster close ties to the community and desire to preserve their customs and unique sociocultural and political as well as economic features from those of governing bodies in power (Ens *et al.,* 2021).

Holism is questioned by our seeming knowledge of unchanging meanings because it emphasizes how interrelated all words are (Tony and Sylvia, 2023). One response I share is that explanations that highlight the interdependence of several components routinely prompt an understanding of a system that goes beyond its surface study (List and Spiekermann, 2013; Monika, 2022).

And critics of deep ecology may argue that the world is more threatened by capitalism and class divisions than by the misanthropic biocentric viewpoint that sees people as a threat to non-human existence. I share the response that it may hurt the poor, underprivileged, and Indigenous peoples to foster an idealized depiction of a pristine nature (Chakraborty, 2015).

Indigenous knowledge systems have so far significantly advanced our understanding of biodiversity and its sustainable use and management in a variety of fields, including impact assessment, traditional medicine and health, rural development and agroforestry, natural disaster response and preparation, and customary marine resource management (IPBES 2013). Ellam (2022) asserted that in the past, indigenous peoples have used their own knowledge and science to coexist and adapt to their environment. As their worldviews have recently put the dominant discourse on sustainable development to the test, indigenous peoples demand that their traditional knowledge be acknowledged and respected, granting them the collective right to manage and use the lands and natural resources that they depend on and protect (Mazzocchi, 2020). This is a significant step forward in the development of nature-based conservation and stewardship projects, which will help Indigenous people see preservation of the environment as an obligation (Vogel et al., 2022). According to a recent study, indigenous people legally or customarily own or manage at least 32% of the world's mappable area, and these territories are in outstanding ecological condition because 55% of them have seen little to no human intrusion (Deen, 2023).

There is also evidence that many indigenous people have strong ties to their environmental locations because they have lived there for many generations (Gladun, 2021), suggesting that they view these places as sacred or having spiritual significance (Redvers, 2023). Additionally, according to the World Wide Fund for Nature (2021), 91% of the areas that indigenous people and local communities safeguard are in good or moderate ecological condition. Researchers interested in novel approaches to the current environmental crisis should be concerned about this evidence, which shows that indigenous people's survival depends on how they use natural resources. Knowing this should encourage researchers to respect cultural sensitivities when collecting data and to acknowledge the importance of specific customs and knowledge of a given people or community (Billan, 2020; Mazzocchi, 2020; Estrada, 2022).

Researchers and policymakers also need to critically examine their own biases and presumptions to avoid applying, for instance, Western

frameworks or different interpretations to indigenous knowledge (Simonds and Christopher, 2013; Gonzalez, 2022). In order to obtain consent, establish reliable relationships, and create coalitions that put the needs and opinions of the community first, researchers should, for example, be mindful of how colonial history and power dynamics may affect the research process and be prepared to interact with indigenous populations in a courteous and cooperative manner (Hart et al., 2016). These approaches are unconventional, as they will lead to a fresh way of seeing, presenting, and applying climate conversation to everyday reality. Indigenous people, who until recently did not have a say in policy issues that have to do with them specifically, now get to see an effort from organisations, institutions, researchers, policymakers, and the global society. They are able and ready to appreciate and contribute their quota to fostering productive and sustainable research that can address their needs and priorities.

## 6. Grounding alternate knowledge in contextualist epistemology

This section challenges us to rethink our usage and justification of different kinds of knowledge in environmental conversation. Contextualist epistemology cautions that "single" knowledge is not always a fact but is warranted in relation to the specific circumstances in which one finds it. This view creates space to embrace other forms of knowing, such as Indigenous ways of knowing, experience, and the knowledge of particular ecological local contexts, as rational and viable. But critics may argue that this would lead to epistemic relativism, in which all statements are equally valid, so it would be difficult to cope with disagreement inherent in an environmental crisis or construct cooperative means of action. To prevent this, we need reflective criteria where we will constantly evaluate knowledge on the basis of its relevance, coherence, and usefulness in its cultural and ecological environment. Rather than letting one system dominate, we must be working towards dialogue and collaboration, where knowledge is co-created in mutual respect and democratic engagement, with all voices heard and considered.

According to Fred Dretske's (1981) relevant alternative theory, "knowing a true proposition one believes at a time requires being able to rule out relevant alternatives to that proposition at that time," which calls for the application of contextualism, a collection of philosophical perspectives that emphasize the context of an action, utterance, or expression. This claim is supported by the idea that human words, acts, and expressions can only be completely understood in the context of a particular situation. Contextualist viewpoints hold that theoretically controversial concepts such as "meaning of x or knowing about x", "having a reason for x", "being true about x", or 'being right about x" only have meanings that are relevant to a particular circumstance. This assertion can be seen as supported by situational ethics. Context-sensitive expressions "present distinct assertions in relation to various circumstances a word is used" (Dretske, 2000b). Because of this, contextualist epistemology's central claim is that knowledge attributions are situation-sensitive, which means that the truth values associated with the word "know" vary depending on the scenario.

Contextualism entails that we can reject the dominant argument in contexts like casual conversations, especially when there are different requirements to declare oneself knowledgeable about a given topic. That would be the equivalent of arguing that when we assign knowledge to something, the standards by which "knowledge" is attributed or rejected in that situation will depend on what sense the term is used. It is in that regard that I am of the view that, to solve epistemological problems and conundrums, epistemologists blend contextualism with theories regarding the nature of knowing. An example of contextualism would be an evidentialist explanation of knowledge that maintains that the degree of justification varies depending on the situation. Hence the necessity of maintaining that the range of relevant alternatives is contingent upon the conversational context and that one might be a contextualist by endorsing the relevant alternative's account of knowing.

## 7. Reframing environmental knowledge through metaphysical coherentism

Local knowledge should be used as a new way of thinking to address climate and environmental issues. I will argue that this requires a correct metaphysical approach that considers the problem from a holistic perspective.

To begin with, there is a need to understand and clarify "*de dicto*" and "*de re*" distinctions and how they could both play out in this discourse on alternate knowledge recommendations and claims. Simply put, "*de dicto*" is a mode of predication where the attribution of a property is made with respect to a description or a proposition rather than directly to the object itself. From its Latin origin, it denotes a predication or reference about the content of a statement or proposition rather than the actual object itself (Nelson, 2023). This propensity manifests itself in an environmental crisis as "M believes that P is important", translating into "The IPCC believes that local knowledge is important in delivering climate solutions." Here, we see that the attribution of importance is made with respect to the content of the proposition "P" rather than to any specific action that can lead to the co-creation or delivery of local knowledge. It poses a concern about whether local knowledge is a given.

On the other hand, a "*de re*" statement attributes a property directly to an object itself, independently of any particular description or proposition. Literally, meaning "about the thing", "*de re*" is simply a mode of predication where the property is attributed directly to the object itself rather than through a description or even an ascription. In this sense, it is fair to conclude that "*de r*e" *stricto sensu* is about the essential nature[2] or intrinsic properties of an object itself, irrespective of its usage, as follows: "The IPCC believes that the adoption of local knowledge can

[2] In general, metaphysical essentialism simply refers to entities that have certain inherent properties that define their identity (Robertson, 2008). Metaphysical essentialism is usually analyzed in this format: If we suppose that an object X has the attribute Y, then X must essentially have Y for it to qualify as the object that it actually is. In any world where X exists, Y must inevitably possess X, provided X contains Y in essence (Mackie, 2006). This form of metaphysical essentialism is an objective concept that is both objective and non-specific with regard to context (Mizrahi, 2014).

diversify climate solutions." Here, the IPCC is referring to the essential nature or properties of local knowledge, which can be considered independent and nonspecific, and it shows that there is a potential for more exploration.

Following the explanation above, though both perspectives can contribute to the delivery of a solution, I will look at how the adoption or recommendation of local knowledge can lead us to a sense of shared responsibility and actions; hence, the emphasis will be on "*de re"* rather than "*de dicto*". This is just a statement about people's beliefs and is primarily the manner in which climate policy decisions are taken, as they concentrate on public perceptions and could be seen where policymakers might consider public opinion polls to gauge support for climate change mitigation efforts, or activists might aim to change public perceptions of climate change through education and advocacy. In exploring "*de re*", it is clear that in such circumstances, concerns will be about the actual impacts of either the crisis or the action taken to address the impacts. Here, debates ought to be centered on direct impacts on specific communities or species.

Let us consider this: "Climate change has a greater impact on the global south," or "Climate change is causing severe weather events in the global south."

Here, attribution to particular effects linked to the climate change phenomenon itself is significant because discourse about national or industry-specific responsibility in the face of climate change frequently reassigns blame to other parties based on their direct involvement in the issue. Such statements are mostly aimed at evaluating the nature of local knowledge, especially with regard to comprehending the nature of the knowledge, the function of various knowledge systems, and the process of acquiring and exchanging knowledge in a changing climate. An inquiry into the ontological status of the environmental crisis thus can inform conversations about different forms of knowledge and investigate whether reality is fundamentally unified or pluralistic, as well as how this relates to the diversity of knowledge systems present in the discourse about climate impacts. An approach such as that can prompt reflections on the ontological status of traditional ecological knowledge and its role

in shaping human-environment interactions. For instance, a conversation about cultural ontology, which examines the nature and structure of cultures, can intersect with considerations of integrating local knowledge into climate policy while also exploring issues related to the existence and nature of cultural entities and their relationship to individuals and communities. More so, a conversation on interconnectedness and interdependence can offer insights into the relational dynamics between different forms of knowledge, their implications for addressing climate impacts, and their role in shaping collective understandings of environmental issues.

Metaphysical theories such as process philosophy or relational ontology, which emphasize the interconnected nature of reality, where entities and phenomena are understood in terms of their dynamic interactions and relationships, may prompt reflections on how different knowledge systems can interact and influence each other within complex socio-ecological systems. Based on such views, it is important that we can apply a similar logic to comprehend how scientific information and local knowledge are interconnected. This understanding can guide tactics for integrating different viewpoints and encouraging teamwork, which are essential for climate action.

I should note that I use the label "metaphysical coherentism" broadly. Its starting point is (1) justificatory holism, Quine and Ullian's (2007) "web of belief", whether such beliefs are considered at an individual or community-wide level. Indigenous people go beyond that because beliefs, methods of gaining knowledge, practices and customs, ways of life in interaction with the environment, throughout history, form a tangled net of mutual influences (2) best labeled as "holism of epistemic practices". In order for these practices to be tethered to the environment and the lived experiences of inhabiting that environment, something metaphysical, worldly, has to be expressed by such practices and their holism, and metaphysics close to local and participatory knowledge might claim (3) mutual grounding, that all things in existence metaphysically depend on each other or mutually ground each other. The seeming triviality that only what exists can ground, considered jointly with mutual grounding, seems to naturally lead to (4) a relational or process-based metaphysics.

(1)–(4) differ starkly, and many more coherentist and relationist views could be considered. My emphasis on contextualism and pluralism, however, is geared to anchor such metaphysical debates in the lived experiences of peoples who face climate change at home. For such practical purposes, and for integrating local knowledge with scientific and policy perspectives on climate change, the conceptual differences between (1)–(4) are not crucial.

## 8. Towards epistemological pluralism in environmental crisis

By adopting different ways of knowing what matters in an environmental crisis, I argue that we can navigate the challenges of dominant epistemologies. The notion of epistemological pluralism is adopted in order to do justice to diverse knowledge approaches to the environmental crisis. This style of analysis can likely lead us to transdisciplinary considerations: where we can easily see the need to value and incorporate alternate knowledge systems and challenge the limitations inherent in dominant frameworks while promoting more holistic, equitable and effective solutions. Implementing this framework in the context of environmental crises can validate various perspectives and help us to pay attention to the interconnectedness of all living things and the environment, providing a relational understanding of ecosystems that differs from the reductionist methods of dominant epistemologies (Whyte, 2017).

This can at the same help us challenge dominant epistemologies by advocating for the inclusion of diverse perspectives that prioritize social justice, community well-being, and ecological balance as against technical or economic fixes alone (Escobar, 2018). In most cases, dominant epistemologies often prioritize objective or value-neutral knowledge, but such approaches, given the current rate of growth for the environmental crisis, may lead to technically feasible but ethically problematic solutions.

Pluralism can assist in dismantling the hegemony of value-neutral approaches and promote solutions that are not only effective but also morally and culturally appropriate (Coulthard, 2014). This is another way

of encouraging inclusion and participation in such a way that traditional top-down decision-making processes can be well navigated while advocating for a more democratic and participatory approach where diverse voices, particularly the non-experts, will be heard (Jasanoff, 2004).

We can drive systemic change by challenging the underlying assumptions and power structures that sustain dominant epistemologies. Contextualism, pluralism, and holism can jointly enable us to question the primacy of scientific rationality, economic efficiency, and technological progress while opening doors to alternative paradigms that prioritize ecological harmony, social equity, and long-term sustainability (Kallis, 2018). Holding onto both approaches could lead us to support degrowth or post-growth economic models that reject the neoliberal emphasis on unending economic growth while also providing us with a fresh perspective that is essential for tackling the complex and interrelated problems of the global environmental crisis in a way that respects various knowledge systems and values.

## 9. Conclusion

When it comes to environmental crises, it is crucial that scientists, researchers, and politicians listen to the opinions of those who would be most impacted by their choices, particularly marginalized people whose voices are frequently left out of the mainstream conversation. I made the case that alternative, non-traditional, and community-based knowledge should be included as essential epistemic resources for environmental governance.

Mere recognition for local knowledge in environmental governance is not enough; I proposed metaphysical coherentism as a norm that could permit us to bring together different kinds of climate knowledge – scientific, local, and Indigenous – into a web of mutual intelligibility, which is a basis for reframing environmental emergencies beyond technocratic terms.

This is also a response to epistemic injustice in so far as it acknowledges that non-dominant cultures have valuable knowledge to

offer, derived from lived experience. Although such knowers are, for now, excluded from decision-making, they are frequently among the most susceptible to environmental degradation, and hence ought to be involved in both knowledge co-production and governance of environmental conversation.

This text argued that local knowledge could support inclusive, sustainable, and place-based environmental solutions by deconstructing wrong assumptions about the environment. As a result, environmental justice is only a distributive problem if it is also an epistemological one, necessitating pluralism, participation, and extensive philosophical engagement with other ways of knowing.

**References**

Abbass, K., Qasim, M. Z., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptations, and sustainable mitigation measures. *Environmental Science and Pollution Research*, 29(28), 42539–42559. https://doi.org/10.1007/s11356-022-19718-6

Akamani, K. (2020). Integrating deep ecology and adaptive governance for sustainable development: Implications for protected areas management. *Sustainability*, 12(14), Article 5757. https://doi.org/10.3390/su12145757

Aneesh, P., Berfond, J., Bhargava, A., Bhatt, A., Chen, J., & Gupta, S. (2020). *Racial disparities and climate change*. Princeton University, PSCI. https://psci.princeton.edu/tips/2020/8/15/racial-disparities-and-climate-change.

Annalisa, S. (2016). The Paris Agreement: A new beginning? *Journal of Energy & Natural Resources Law*, 34(1), 16–26. https://doi.org/10.1080/02646811.2016.1133983

Babiker, M., Vinson, T., & Criqui, P. (2000). The Kyoto Protocol and developing countries. *Energy Policy*, 28(8), 525–536. https://doi.org/10.1016/S0301-4215 (00)00033-1

Barnett, J., Lambert, S., & Fry, I. (2008). *Global environmental change and human security*. In H. G. Brauch, J. Grin, C. Mesjasz, P. Dunay, N. C. Behera, B. Chourou, P. Kameri-Mbote, P. H. Liotta, & J. Oswald Spring (Eds.), Globalization and environmental challenges (pp. 315–324). Springer. https://doi.org/10.1007/978-3-540-75977-5_24

Barrett, S. (1998). *Political economy of the Kyoto Protocol*. Oxford Review of Economic Policy, 14(4), 20–39. https://doi.org/10.1093/oxrep/14.4.20

Behrens, K. (2010). *Exploring African holism with respect to the environment. Environmental Values*, 19(4), 465–484. https://doi.org/10.3197/096327110X531552

Billan, J. (2020). Ethical research engagement with Indigenous communities. *Journal of Rehabilitation and Assistive Technologies Engineering*, 7.

Birkmann, J., Liwenga, E., Pandey, R., Boyd, E., Djalante, R., Gemenne, F., Leal Filho, W., Pinho, P. F., Stringer, L., & Wrathall, D. (2022). "Poverty, livelihoods, and sustainable development." In H.-O. Portner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), *Climate change 2022: Impacts, adaptation, and vulnerability* (pp. 1171–1278). Cambridge University Press. https://doi.org/10.1017/9781009325844.010

Bond, P. (2012). *Politics of climate justice: Paralysis above, movement below*. University of KwaZulu-Natal Press.

Burelli, C., & Pala, D. (2021). The environmental crisis and its injustice: An inevitably short introduction. *Rivista di Estetica*, 75, 3–16. https://doi.org/10.4000/estetica.7190

Chakraborty, R. (2015). The deep ecology/ecofeminism debate: An enquiry into environmental ethics. *Journal of the Indian Council of Philosophical Research*, 32(1), 123–134. https://doi.org/10.1007/s40961-015-0005-y

Chapman, J. M., & Schott, S. (2020). Knowledge coevolution: Generating new understanding through bridging and strengthening distinct knowledge systems and empowering local knowledge holders. *Sustainability Science*, 15(3), 931–943. https://doi.org/10.1007/s11625-020-00781-2

Chu, E. W., & Karr, J. R. (2017). Environmental impact: Concept, consequences, and measurement. In *Reference module in life sciences*. Elsevier. https://doi.org/10.1016/B978-0-12-809633-8.02380-3

Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. University of Minnesota Press. https://doi.org/10.5749/j.ctt9qh3cv

Dawson, N., Coolsaet, B., Sterling, E., Loveridge, R., Gross-Camp, N., Wongbusarakum, S., Sangha, K. K., Scherl, L. M., Phan, H. P., Zafra-Calvo, N., Lavey, W. G., Byakagaba, P., Idrobo, C. J., Chenet, A., Bennett, N. J., Mansourian, S., & Rosado-May, F. J. (2021). The role of Indigenous peoples and local communities in effective and equitable conservation. *Ecology and Society*, 26(3), Article 19. https://doi.org/10.5751/ES-12625-260319

Deen, S. (2023). Embedding Indigenous knowledge in the conservation and restoration of landscapes (Insight Report). *World Economic Forum*. https://www3.weforum.org/docs/WEF_Embedding_Indigenous_Knowledge_2023.pdf

Dretske, F. I. (1981). *Knowledge and the flow of information*. MIT Press.

Dretske, F. I. (2000b). *The pragmatic dimension of knowledge. In Perception, knowledge, and belief: Selected essays* (pp. 48–63). Cambridge University Press. https://doi.org/10.1017/CBO9780511625299.004

Dumitru, M. (2004). *Explorări logico-filozofice*. Bucureşti: Humanitas.

Ellam, Y., Raymond-Yakoubian, J., Daniel, R., & Behe, C. (2022). A framework for co-production of knowledge in the context of Arctic research. *Ecology and Society*, 27(1), Article 34. https://doi.org/10.5751/ES-12960-270134

Ens, E., Faulks, M., Finlayson, C. M., & Marrfurra McTaggart, P. (2021). Recognition of Indigenous ecological knowledge systems in conservation and their role to narrow the knowledge-implementation gap. In C. C. Ferreira & C. F. C. Klutsch (Eds.). *Closing the knowledge-implementation gap in conservation science* (pp. 109–139). Springer. https://doi.org/10.1007/978-3-030-81085-6_5

Escobar, A. (2018). *Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds*. Duke University Press. https://doi.org/10.1215/9780822371816

Estrada, A., Garber, P. A., Gouveia, S., Fernandez-Llamazares, Á., Ascensao, F., Fuentes, A., Katti, M., Shaffer, L. J., Spehar, S., Strier, K. B., Vollmer, W., & Wittemyer, G. (2022). Global importance of Indigenous peoples, their lands, and knowledge systems for saving the world's primates from extinction. *Science Advances*, 8(31), Article eabn2927. https://doi.org/10.1126/sciadv.abn2927

European Environment Agency. (2022). *Soil pollution and health*. https://www.eea.europa.eu/publications/zero-pollution/health/soil-pollution

Falkner, R. (2016). The Paris Agreement and the new logic of international climate politics. *International Affairs*, 92(5), 1107–1125. https://doi.org/10.1111/1468-2346.12708

Gare, A. (1996). *Environmental destruction and the metaphysics of sustainability*. Eco-Logical Press.

Gladun, E. (2021). Indigenous economies in the Arctic: To thrive or to survive? *Elementa: Science of the Anthropocene*, 9(1), Article 00088. https://doi.org/10.1525/elementa.2019.00088

Gonzalez, R., Kretz, L., & Martinez, R. (2022). Psychology and Indigenous people. *Annual Review of Psychology*, 73, 431–459. https://doi.org/10.1146/annurev-psych-012921-045304

Hart, M. A., Straka, S., & Rowe, G. (2017). Working across contexts: Practical considerations of doing Indigenist/anti-colonial research. *Qualitative Inquiry*, 23(5), 332–342. https://doi.org/10.1177/1077800416659084

Hosen, N., Nakamura, H., & Hamzah, A. (2020). Adaptation to climate change: Does traditional ecological knowledge hold the key? *Sustainability*, 12(2), Article 676. https://doi.org/10.3390/su12020676

Intergovernmental Panel on Climate Change. (2001). *Climate change 2001: Impacts, adaptation, and vulnerability* (J. J. McCarthy, O. F. Canziani, N. A. Leary, D. J. Dokken, & K. S. White, Eds.). Cambridge University Press.

Intergovernmental Panel on Climate Change. (2022). *Summary for policymakers*. In H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría, M.

Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), *Climate change 2022: Impacts, adaptation, and vulnerability* (pp. 3–33). Cambridge University Press. https://doi.org/10.1017/9781009325844.001

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services* (S. Díaz, J. Settele, E. S. Brondízio, H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, & C. N. Zayas, Eds.). IPBES Secretariat. https://doi.org/10.5281/zenodo.355357Jasanoff, S. (Ed.). (2004). States of knowledge: The co-production of science and the social order. Routledge. https://doi.org/10.4324/9780203413845

Kallis, G. (2011). In defence of degrowth. *Ecological Economics*, 70(5), 873–880. https://doi.org/10.1016/j.ecolecon.2010.12.007

Keller, E., Norman, A., & Ebi, K. L. (2022). A systematic review of the psychological distance of climate change: Towards the development of an evidence-based construct. *Journal of Environmental Psychology*, 81, Article 101822. https://doi.org/10.1016/j.jenvp.2022.101822

Kennedy, L. M., & Pauw, P. (2016). *Self-differentiation of countries' responsibilities: Addressing climate change through intended nationally determined contribution*s (Report No. 4/2016). German Development Institute. https://doi.org/10.13140/RG.2.1.3087.0162

Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants*. Milkweed Editions.

Kronlid, D. (2003). *Ecofeminism and environmental ethics: An analysis of ecofeminist ethical theory* (Uppsala Studies in Social Ethics, 28). Uppsala University. ISBN 91-554-5516-6

List, C., & Spiekermann, K. (2013). Methodological individualism and holism in political science: A reconciliation. *American Political Science Review*, 107(4), 629–643. https://doi.org/10.1017/S0003055413000373

Lohmann, L. (2006). Carbon trading: A critical conversation on climate change, privatisation and power. *Development Dialogue*, 48, 1–359.

Mackie, P. (2006). *How things might have been: Individuals, kinds, and essential properties*. Oxford University Press. https://doi.org/10.1093/0199272204.001.0001

Maffi, L. (Ed.). (2001). *On biocultural diversity: Linking language, knowledge, and the environment. Smithsonian Institution Press*. ISBN 1-56098-930-0

Mallory, C. (2010). Who knows? Ethics and epistemologies of climate change and environmental justice (Conference paper). *Climate, Ethics, and Energy PanelDiscussion*.https://www.academia.edu/32045105/Who_Knows_Ethics_and_Epistemologies_of_Climate_Change_and_Environmental

Maurya, K. P., Kumar, A., & Kumar, P. (2020). An introduction to environmental degradation: Causes, consequences, and mitigation. In Environmental degradation: Causes and remediation strategies (pp. 1–20). *Agriculture and Environmental Science Academy*. https://doi.org/10.26832/aesa-2020-edcrs-01

Mazzocchi, F. (2020). A deeper meaning of sustainability: Insights from Indigenous knowledge. *The Anthropocene Review*, 7(1), 77–93. https://doi.org/10.1177/2053019619898888

Mizrahi, M. (2014). Essentialism: Metaphysical or psychological? *Croatian Journal of Philosophy*, 14(1), 65–72.

Monika, D. S. (2022). Climate change, holism, evolution, and collective intelligence. *Sustainability and Climate Change*, 15(5), 387–395. https://doi.org/10.1089/scc.2022.0047

Mustonen, T., Feodoroff, P., & Mustonen, K. (Eds.). (2021). *Compendium of Indigenous knowledge and local knowledge: Towards inclusion of Indigenous knowledge and local knowledge in global reports on climate change*. Snowchange Cooperative. https://doi.org/10.13140/RG.2.2.14498.76485

Mustonen, T., Huusari, L., Feodoroff, P., & Mustonen, K. (2022). The role of Indigenous knowledge and local knowledge in understanding and adapting to climate change. In *Climate resilient development pathways* (pp. 2713–2728). Research Gate. https://www.researchgate.net/publication/362432216

Naess, L. O. (2013). The role of local knowledge in adaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 4(2), 99–106. https://doi.org/10.1002/wcc.204

Nelson, M. (2023). Propositional attitude reports. In E. N. Zalta & U. Nodelman (Eds.), *The Stanford Encyclopedia of Philosophy* (Spring 2023 ed.). Stanford University.https://plato.stanford.edu/archives/spr2023/entries/prop-attitude-reports/

Parsons, M., Nalau, J., & Fisher, K. (2017). Alternative perspectives on sustainability: Indigenous knowledge and methodologies. *Challenges in Sustainability*, 5(1), 7–14. https://doi.org/10.12924/cis2017.05010007

Petzold, J., Andrews, N., Ford, J. D., Hedemann, C., & Postigo, J. C. (2020). Indigenous knowledge on climate change adaptation: A global evidence map of academic literature. *Environmental Research Letters*, 15(11), Article 113007. https://doi.org/10.1088/1748-9326/abb330

Pörtner, H.-O., Scholes, R. J., Agard, J., Archer, E., Arneth, A., Bai, X., Barnes, D., Burrows, M., Chan, L., Cheung, W. W. L., Diamond, S., Donatti, C., Duarte, C., Eisenhauer, N., Foden, W., Gasalla, M. A., Handa, C., Hickler, T., Hoegh-Guldberg, O., … Ngo, H. T. (2021). IPBES-IPCC co-sponsored workshop report on biodiversity and climate change. *IPBES and IPCC*. https://doi.org/10.5281/zenodo.5101133

Pratt, G. C., Vadali, M. L., Kvale, D. L., & McKinley, E. L. (2015). Traffic, air pollution, minority, and socio-economic status: Addressing inequities in exposure and risk. *International Journal of Environmental Research and Public Health*, 12(5), 5355–5372. https://doi.org/10.3390/ijerph120505355

Quine, W. V., and J. S. Ullian. 2007. *Ţesătura Opiniilor. (*Romanian edition of *Web of Belief)*. Translated by Mircea Dumitru. Pitești, Romania: Paralela 45.

Ranniger, G. (2020, July 7). Environmental injustice (News article). *Environmental Health News*.https://www.ehn.org/environmental-injustice-2646393134.html

Redvers, N., Yellow Bird, M., Quinn, D., Yunker, P., & Belcourt, B. (2023). Indigenous peoples: Traditional knowledge, climate change, and health. *PLOS Global Public Health*, 3(10), Article e0002474. https://doi.org/10.1371/journal.pgph.0002474

Reed, M. G., Godmaire, H., Abernethy, P., Guertin, M.-A., Hewitt, N., & Fortier, J.-F. (2023). *Guiding principles for transdisciplinary sustainability research and practice. People and Nature*, 5(4), 1094–1109. https://doi.org/10.1002/pan3.10496

Rentschler, J., & Leonova, N. (2023). *Global air pollution exposure and poverty. Nature Communications*, 14(1), Article 4637. https://doi.org/10.1038/s41467-023-39797-4

Reyes-García, V., Fernández-Llamazares, A., García-del-Amo, D., Matias, D. M., Benyei, P., Junqueira, A. B., & Schunko, C. (2024). Local studies provide a global perspective on the impacts of climate change on Indigenous peoples and local communities. *Sustainable Earth Reviews*, 7(1), Article 1. https://doi.org/10.1186/s42055-023-00063-6

Rigby, K. (2007). Tragedy, modernity, and terra mater: Christa Wolf recounts the fall. *New German Critique*, 34(2), 115–141 bundles. https://doi.org/10.1215/0094033X-2007-005

Robertson, T. (2008). Essential vs. accidental properties. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2008 ed.). Stanford University. https://plato.stanford.edu/archives/fall2008/entries/essential-accidental/

Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. *Wiley Interdisciplinary Reviews: Climate Change*, 5(3), 359–374. https://doi.org/10.1002/wcc.275

Siddiqua, A., Hahladakis, J. N., & Al-Attiya, W. A. K. (2022). An overview of the environmental pollution and health effects associated with waste landfilling and open dumping. *Environmental Science and Pollution Research*, 29(39), 58514–58536. https://doi.org/10.1007/s11356-022-21578-z

Simonds, V. W., & Christopher, S. (2013). Adapting Western research methods to Indigenous ways of knowing. *American Journal of*

*Public Health*, 103(12), 2185–2192. https://doi.org/10.2105/AJPH.2012.301157

Swiderski, J. (2024). Varieties of metaphysical coherentism. *Erkenntnis*, 89(5), 1861–1886. https://doi.org/10.1007/s10670-022-00607-w

Tony, L., & Vitello, S. (2023). What is a holistic judgment, anyway? Research Papers in Education. *Advance online publication*. https://doi.org/10.1080/02671522.2023.2269960

Tosun, J., & Peters, B. G. (2021). The politics of climate change: Domestic and international responses to a global challenge. *International Political Science Review*, 42(1), 3–15. https://doi.org/10.1177/0192512120975659

Turner, N. J., Boelscher Ignace, M., Marshall, M. B., Bhattacharyya, J., & Cocksedge, W. (2022). Well grounded: Indigenous peoples' knowledge, ethnobiology, and sustainability. *People and Nature*, 4(3), 627–651. https://doi.org/10.1002/pan3.10321

United Nations. (1998). *Kyoto Protocol to the United Nations Framework Convention on Climate Change, United Nations Treaty Series*, 2303, 162. https://treaties.un.org/doc/Treaties/1998/09/19980921%2006-41%20PM/Ch_XXVII_07_ap.pdf

United Nations Development Programme. (2023). *Climate change, environmental degradation, conflict, and displacement in the Arab States region (Policy brief)*. UNDP.https://www.undp.org/sites/g/files/zskgke326/files/202306/climate_environmental_security_rbas_policy_brief_may_2023.pdf

United Nations Environment Programme. (2023). *Emissions gap report 2023: Broken record – Temperatures hit new highs, yet world fails to cut emissions (again)*. UNEP. https://doi.org/10.59117/20.500.11822/43922

UNESCO. (2018). *Indigenous knowledge is needed for climate change assessment and adaptation* (D. Nakashima, I. Krupnik, & J. T. Rubis, Eds.). Cambridge University Press.

Val, P. (2002). *Environmental culture: The ecological crisis of reason*. Routledge. ISBN 9780415178785

Vogel, B., Sangha, K. K., & Low, N. (2022). Indigenous-led nature-based solutions for the climate crisis: Insights from Canada. *Sustainability*, 14(11), Article 6725. https://doi.org/10.3390/su14116725

Whyte, K. P. (2017). Indigenous climate change studies: Indigenizing futures, decolonizing the Anthropocene. *English Language Notes*, 55(1–2), 153–162. https://doi.org/10.1215/00138282-55.1-2.153

World Wide Fund for Nature. (2021). *The state of Indigenous peoples and local communities' lands and territories in Switzerland* [Report]. WWF. https://wwflac.awsassets.panda.org/downloads/report_the_state_of_the_indigenous_peoples_and_local_communities_lands_and_territories_1.pdf

Zvobgo, L., Totin, E., Simpson, N., van der Merwe, L., Vogel, C., & Leal Filho, W. (2022). *The role of Indigenous knowledge and local knowledge in water sector adaptation to climate change in Africa: A structured assessment. Sustainability Science*, 17(5), 2077–2092. https://doi.org/10.1007/s11625-022-01118-x