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Local knowledges and the right to participate in science

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Abstract.

I discuss the right to participate in science, which is part of the UN Declaration of Human Rights (1948) and the International Covenant on Economic Social and Cultural Rights (1966). Building on my previous work on this right as an ‘epistemic-cultural’ right, in this paper my goal is to clarify how fulfilling this right requires engaging with varieties of local knowledges that are too often severed in scientific narratives. I tease out three main varieties of local knowledges and highlight their distinctive features and their intersectionalities. In the second part of the paper, I argue that a more careful appreciation of varieties of local knowledges is not only key for the fulfilment of the right to participate in science but also for other human rights. I focus my attention here selectively on the right to food, and right to clean water. I conclude by highlighting the implications of this discussion for ongoing legal debates on rights of nature.

1. What is the right to participate in science?

On December 10, 1948, in a Europe that had just come out from World War II and with the Cold War looming large, the newly established United Nations General Assembly adopted at the Palais de Chaillot in Paris the Universal Declaration of Human Rights (UNDHR). The UNDHR¹ recognized rights and freedoms to be enjoyed by human beings “without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status” (Art. 2). Some of these rights are fundamental civil and political rights, such as the “right to life, liberty and security of the person” (Art. 3); the right to be free from slavery (Art. 4), from “torture, cruel, inhumane or degrading treatment or punishment” (Art. 5), and from “arbitrary arrest, detention or exile” (Art 9.); the

¹ See <https://www.ohchr.org/en/universal-declaration-of-human-rights>.

right to freedom of movement (Art 13), and the right to seek and enjoy “asylum from persecution” (Art. 14), among many others.

Other rights fell into the category of social, economic, and cultural rights, such as the “right to work” (Art. 23), “right to education” (Art. 26), and—my topic here—the right to freely “participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits” (Art. 27.1). Buried almost at the end of the UNDHR, Art. 27.1 marks a cluster of so-called “cultural rights” which include the right to participate in cultural life, the right to benefit from scientific progress and its applications, and the right to the protection of the moral and material interests of authors of scientific, artistic, or literary works (Art. 27.2).

It fell upon the International Covenant for Economic Social and Cultural Rights (ICESCR)² in 1966, agreed upon and ratified by various nation states (with some notable exceptions, including the United States, which has not ratified it yet), to turn the universal human rights framework laid out by the UNDHR into a legally binding instrument. And there too one finds reiterated in Art. 15.1.b *the right for everyone to enjoy the benefits of scientific progress and its applications* (REBSP). The shorthand (often questioned and disputed) name of “right to science” refers to Art. 27.1 of the 1948 UNDHR and its ICESCR 1966 counterpart as Art. 15.1.b.

In 2009, UNESCO complained about the patchy implementation of the right to date (UNESCO 2009). Recently, significant legal work has gone into trying to interpret the normative content of the right (see, e.g., Porsdam and Porsdam Mann 2021), which has long been perceived as vague. What did the founders of the UNDHR mean by the right to “share in scientific advancement,” or, in its 1966 formulation, the right to “enjoy the benefits of scientific progress”?

In a recent monograph dedicated to the topic Romano and Boggio articulate a possible normative framework for understanding the right to science as consisting of what they enumerate as a number of other “discrete rights ... grouped into four clusters: the right to

² See <https://www.ohchr.org/en/instruments-mechanisms/instruments/international-covenanteconomic-social-and-cultural-rights>.

scientific progress; the right to socially responsible science; the right to participate in scientific progress; and the right to benefit from scientific progress” (2024, xxiv).

Such taxonomy is presented as grounded in the history and normative analysis of the right. For example, historically, the right to scientific progress might be regarded as a supercluster of related rights such as the right to freedom of scientific opinion, freedom of scientific assembly, freedom of movement for scientists, but also the right to scientific literacy, and the right to access the scientific profession, among others (ibid., ch. 11).

I won't delve into this complex legal taxonomy and its ramifications in terms of institutional duties and obligations for nation states to respect, protect, and fulfil these rights. In what follows, I selectively zoom in on the particular *participatory aspect* of the right to science, which is also the way in which the right has more recently been increasingly understood and interpreted by legal scholars (inc., e.g., Bideault 2021; Porsdam 2022; Besson 2024b). This participatory aspect was stressed in the work of the UN Special Rapporteur on Cultural Rights, first in the 2012 report by Farida Shaheed (Shaheed 2012) and more recently in the 2024 report by Alexandra Xanthaki (Xanthaki 2024). The 2024 report is significantly titled “Right to Participate in Science” (rather than simply “Right to Science”). I had the honor to contribute to this UN report as an invited expert, and the topic of “participation in science” remains one of the philosophically most underexplored aspects in the multifaceted normative content of the right to science.

The right to participate in science tends to be mainly understood in terms of the right to scientific literacy, the right to access the scientific education and profession, the right to participate in research, and the right to participate in scientific affairs. It goes without saying that these rights are crucial and remain under severe threat in many parts of the world where stark inequalities and ethnic and gender segregations prevent, for example, Afghan girls and women³ from accessing schools and scientific education (Donders 2023), and that the right to freedom of movement for scientists continues to be restricted in many countries (see Xanthaki 2024, item 71).

³ See <https://www.unesco.org/en/articles/let-girls-and-women-afghanistan-learn> and https://unama.unmissions.org/sites/default/files/moral_oversight_report_english_final.pdf.

But the right to participate in science hides a much wider scope and remit.⁴ It signals that participation in science is part and parcel of a wider set of cultural rights, including the right to participate in the cultural life of the community, in the original 1948 formulation of the UNDHR Art. 27.1 and reiterated in ICESCR Art. 15.1.a. Hence my topic in this article: how to understand the *participatory* aspect of the right to science as part of wider cultural practices.

My goal is twofold. First, I tease out and draw attention to three different kinds of local knowledges whose contribution and significance for scientific knowledge continue to remain largely underexplored in the epistemology of science (much as their relevance has been discussed in science and technology studies, anthropology, cultural studies, and other fields). I will call them *place-bound* (LK.I), *place-based* (LK.II), and *place-indexed* knowledge (LK.III). My first goal is to get clear on what makes each variety of local knowledge unique and valuable, and to clarify their interrelations. Often in the literature these varieties are not clearly distinguished and there is a tendency to lump very different ways of knowing under the generic heading of “local knowledge,” which in turn leads to ambiguity and some unfortunate consequences.

My second goal is to argue that the right to participate in science must not be understood according to a deficit model, whereby there is, on the one hand, Science (as normally understood in the Western canon qua axiomatized body of knowledge codified in a textbook such as Newtonian mechanics in Newton’s *Principia*, to give one example) and, on the other hand, humankind at large who has a right to access Science. The right to participate in science does not capture a moral duty of scientists to redistribute knowledge to what gets

⁴ A ground-clearing remark on the use of the term “participatory,” which might unwittingly summon the specter of a deficit model of knowledge distribution compared to the language of “co-creation” or “co-development” of knowledge. The human rights law literature has made it clear how participation implies a conceptualization of science as a “common good,” something reiterated by Xanthaki (2024) and advocated by the International Science Council (Boulton 2021). See also the International Science Council’s more recent take on this topic: https://council.science/wp-content/uploads/2024/11/The-Right-to-Participate-in-and-Benefitfrom-Science_ISC.pdf. For an analysis of human rights and communal goods see Waldron (1987) and Besson (2024b), building on Réaume (1988). On communal goods and ocean policy, see Massimi (2024b).

often inaccurately referred to as “lay” persons⁵ (much as, of course, right to access scientific education and scientific information remains paramount).

Instead, this universal human right unequivocally indicates that *everyone* can legitimately reclaim as their own the right to participate in science and to enjoy the benefits resulting from scientific progress.⁶ How can this be? In the rest of this article, I argue that *everyone* has the right to participate in science *by virtue of their own local, reliable ways of knowing* and associated value thereof for scientific knowledge at large.

There is more. What makes those local, reliable ways of knowing valuable and significant is not the extent to which they feed, contribute, integrate into Science; but rather the fact that they speak to the specific epistemic, cultural, and practical needs of the local communities in question. Such local ways of knowing are key to tackle a number of pressing socioeconomic challenges which often cannot be addressed just by Science. Moreover, as I will argue, fulfilling the right to participate in science means respecting varieties of local knowledges that are often key to fulfilling other important human rights. Here I concentrate mainly on two such rights, the right to food and the right to clean water; but I shall also briefly discuss implications for so-called “rights of nature” at the end of the article.

Before I dive into the topic, it is important to make four brief ground-clearing remarks. The label “local knowledge” has a long history and carries a heavy baggage. Often in legal documents and treaties, the term is used interchangeably with “traditional knowledge” or “traditional ecological knowledge” by Indigenous People. This is *not* the way I shall use the term in what follows. As will soon become clear, in the philosophical literature, the term has been used in a much broader sense to capture varieties of knowledges that are

⁵ The term “lay” person has often been used in the context of making a distinction between so-called “lay expertise” and “scientific expertise,” where the latter is a kind of certified expertise in a way that the former is not. But the term is contested because it buys into deficit models of epistemic authority. For a discussion, see e.g. Turnhout, Tuinstra, and Halfmann (2019).

⁶ To be clear, the universal human rights language uses the pronoun “everyone” to indicate an entitlement, not an intimation or a duty. Saying that everyone has the right to participate in science (in the way to be clarified here below) does not mean (and was never meant to suggest) that therefore everyone *must* participate in science, as if participation in science were some kind of coercive exercise. While “ought” implies “can,” it has never been the case that “can” implies “ought.”

often experiential and artisanal, orally transmitted but not necessarily codified into a written text. One motivation for this article is precisely to get some clarity on different meanings associated with this highly contested label of “local knowledge” in different contexts. Recognizing the intersectionality of some of these meanings is important especially in policy contexts (see, e.g., Morgera 2019), as it is also important to recognize the relevant differences in how the term is used in different contexts.

Second, a word of caution about how to read the adjective “local.” “Local” should not be immediately understood in an unqualified geographical/spatial sense. This is so especially considering how some of the communities that have such knowledge have often been subject to diaspora (e.g. Hebridean crofters in my example below), migration, or forced displacement (e.g. Indigenous People). As I explain in section 4, different varieties of “local knowledges” speak instead to different *epistemic features* of the knowledge in question *qua* knowledge *of a practice*; or knowledge *of cultural keystone species*; or knowledge *of a place*.

Third, mentioning “local knowledges” in relation to the human right to participate in science may raise the worry that one is unwittingly diminishing these varieties of ways of knowing by calling them “knowledges” rather than “sciences.” In this article, I intentionally stay out of the long-standing debate about these contested labels, much as in other work (Massimi 2024a, 140) I sided with Harding (2015) in her defence of the label “science” for Micronesian navigation. My working assumption is a view of science as reliable knowledge production (Massimi 2022) that levels the epistemic playing field for varieties of reliable knowing.

For further clarity, it is not my goal to eliminate any distinction between science and reliable knowledge production. Nor is my aim to define “science;” or identify constitutive features of science; or engage in questions about the demarcation criteria between science and non-scientific-yet-still-reliable knowledge. My goal is simply to provide reasons for engaging with varieties of *local knowledges qua reliable knowledges* in their own right. In so doing, I will also explain why in various contexts these forms of knowledge are relevant to addressing a number of challenges (from food security to environmental pollution). I see this as a key aspect of the participatory aspect of the human right to science, which was originally packed as part of a broader right to participate in the cultural life of the community.

Fourth, one might have the further worry that the overall participatory approach to science qua reliable knowledge production might unwittingly open the floodgate to all sort of bogus claims familiar from contemporary debates about misinformation and disinformation (for a discussion, see O'Connor and Weatherall 2019). At a time when scientists are under attack and the epistemic standing of science is questioned at a high level in governments around the world, it would be a very sorry outcome if philosophical work of this nature were weaponized in a perverse and malicious reading.

Let me then be crystal clear. Recognizing the importance of varieties of local knowledges for the human right to participate in science does not open any door to improvised self-declared “experts” on matters concerning hydroxychloroquine and COVID, climate change denial, and so on. There is a reason why “reliability” is center stage in my account. None of those bogus claims would get anywhere near the benchmark of reliability when it comes to the ability to use the claims for explaining facts, making predictions about outcomes, or delivering projections about future scenarios. Reliable knowledge, by the very definition of being reliable, cannot be fudged.

In addition to these four ground-clearing remarks, let me tackle two preliminary objections. The first is that the right to science might seem to some to weaponize science for some ethically dubious practices (especially when it comes to access to and collection of scientific data). The second objection is that a human rights approach to science may seem to many parochial, at best, and the expression of universalist imperialist tendencies typical of Western science, at worst. The next section addresses these two preliminary objections.

2. Two preliminary objections and replies

2.1 The risk of weaponizing science and the duty to anticipate harmful uses

A human rights approach to science might sound dubious to start with. It might summon the specter of science being weaponized through a legal toolkit that could legitimize ethically dubious practices in the name of the “right to science.” Maybe unsurprisingly, the few existing uses of this (by and large neglected) human right to date have been in some controversial areas of the biomedical sciences. For example, the right to science has been invoked in the context of an international code of conduct for genomic and clinical data sharing and access to the human genome treated as access to the common heritage of humankind (Knoppers 2014; Knoppers et al. 2014). Genomic data sharing has often been

portrayed as a way of boosting the communal sharing in scientific advancement and fostering international collaboration in areas such as cancer research, among others.

After all, is not this an example of what Art. 15.1.b describes as the enjoyment of the benefits resulting from scientific progress and its applications? Arguably, under a narrowly construed interpretation of the right as *mostly* a right to *access* scientific information and data and the benefits resulting from it, one might be easily led to make this inferential leap. The right to science would seem to act as a proxy for accessing confidential and private patients' data in the name of fostering scientific research, developing new drugs, and innovations ultimately benefiting humankind at large.

I share here the skeptical sentiments of many in this particular use of this important human right and I worry about the potential misuses and abuses it might lend itself to, especially when it comes to collecting and potentially sharing confidential and private clinical data. Such a risk becomes even more severe when the clinical and genomic data in question may concern stigmatized groups (see also Fox 2020).

In reply to this worry, it is important to recognize that in the context of post-World War II and the staggering emergence of dual-use technologies, the founders of the UNDHR crafted the right as a dual right to share in scientific advancements as much as to anticipate harmful uses of such advancements. Therefore, the right comes with so-called “anticipation duties”: duties to identify the beneficial uses of the scientific research as much as duties to protect against possible harmful uses (see Besson 2024a; Plozza 2024).

As Boggio (2024) has outlined, anticipation duties divide into three categories: beneficial, responsible, and participatory. The latter category stresses the communal aspect of the right and how the duty to protect against possible harmful uses does not fall only on state parties as the duty-bearers in international law. Nor does it fall on scientists only either; rather, it falls equally on society at large. Hence the need to have proper participatory

anticipation mechanisms built into science policy, for example in the form of public consultations when it comes to controversial research programs.⁷

But for now, in response to the first objection, it suffices to stress that a human right to participate in science should not be misunderstood or misconstrued as some blanket legal claim to access critical or sensitive data in the name of science and scientific progress. This is not the way the right was originally conceived, nor the way in which it is interpreted by legal scholars, who have stressed the anticipation duties associated with this right.

2.2 Against a human rights approach to science: the specter of Western imperialism and the role of cultural diversity

Another objection that is often raised in this context concerns the universalism of human rights. What is to be said about it in light of the great variety of cultural traditions worldwide? Is not the universalism of human rights (including the right to science) just a disguised form of cultural imperialism, a way of reaffirming Western views as if they were applicable to everyone and everywhere?

The story behind this objection is fascinating. For reasons of space I cannot engage with it properly in this article. It suffices to say that the founders of the UNDHR worried about the reception and resonance of the declaration, and in the months leading up to the final draft, UNESCO convened a committee to discuss the philosophical foundations of the universal rights. The ensuing proceedings (UNESCO 1973) include letters from e.g. Gandhi, British historian E.H. Carr, Spanish writer Salvador de Madariaga, Italian philosopher Benedetto Croce, Chinese Confucian philosopher Chung-Shu Lo, and Bengali novelist Humayun Kabir, among others.⁸ In the introduction to the volume, the French philosopher Jacques Maritain reported that

someone expressed astonishment that certain champions of violently opposed ideologies had agreed on a list of those rights. “Yes,” they said, “we agree about the

⁷ Boggio, for example, refers to the decision by the World Health Organization in 2020 to run a public consultation on the governance and oversight of human genome editing (Boggio 2024, 24).

⁸ For an account of the history of the UNDHR and the role of the philosophers’ committee (as it became known), see Glendon (2001, Ch. 5).

rights *but on condition that no one asks us why.*” That “why” is where the argument begins. (UNESCO 1973, 9, emphasis in original)

And that argument was not just a philosophical one on the foundations of human rights;⁹ it was also an anthropological one. In 1947, the American Anthropological Association (AAA) made a statement which—sensitive to the climate of the Cold War period—decried the UNDHR as

“a statement of rights conceived only in terms of the values prevalent in the countries of Western Europe and America.”¹⁰ Far from being merely academic debates, discussions about cultural diversity and the universalism of human rights continued in the following decades with the “Bangkok Declaration”¹¹ (see Sen 1977; Jacobsen and Bruun 2000).

In 1999, the AAA issued a new statement on the matter where the new political climate characterized by increasing political volatility, the rise of autocratic regimes, and the related widespread violations of human rights led to a more mitigated tone compared to the 1947 statement. In brief, the AAA supported the universalism of UNDHR with due qualification about cultural diversity and culturally appropriate implementations.¹²

While the debate on cultural relativism and human rights (Renteln 1988) popular during the Cold War decades has been in decline for a while, discussions continue about conceptual universality vs. ontological universality underpinning human rights.¹³

When the universalism of human rights is misused as a fig leaf to camouflage aggressive Western foreign policies of intervention in other states, it has rightly been condemned (Gott 2002; Kennedy 2003). At the same time, universal, equal, and inalienable human rights within a properly multidimensional and multicultural framework continue to remain the only transnational tool available to fight widespread abuses perpetrated by state

⁹ See Cruft, Liao, and Renzo (2015) for an overview of philosophical views on human rights.

¹⁰ See <https://humanrights.americananthro.org/1947-statement-on-human-rights/>.

¹¹ See <https://digitallibrary.un.org/record/170675?v=pdf>.

¹² See <https://humanrights.americananthro.org/1999-statement-on-human-rights/>.

¹³ Donnelly, for example, easily accepts the conceptual universality of human rights qua the recognition that human rights are by definition inalienable and held by everyone equally; but contests ontological universality as the thesis that human rights have a “single transhistorical foundation” (2007, 292).

parties and local governments against women, children, LGBTQIA+ people, Indigenous People, ethnic minorities, and marginalized local communities anywhere in the world. One should be careful not to confuse politics and culture, or, as Donnelly (2007, 296) aptly puts it, “what a people has been forced to tolerate with what it values,” as populistic-nationalistic appeals to local cultural values by some state parties have often done against the universalism of human rights.¹⁴

Maybe in the end, Jacques Maritain was correct all along in the original diagnosis: it is relatively easy to agree on a list of human rights “but do not ask us why.” It is possible to uphold a conceptual or even a pragmatic notion of universalism for human rights as rights that apply to all human beings in an equal and inalienable way, without having to endorse necessarily any epistemic-ontic universalism for their foundations.¹⁵ Likewise, it is possible to recognize the plurality of cultures and culturally appropriate applications of human rights in regional contexts in the overarching respect of universal human rights for women, children, LGBTQIA+ people, Indigenous People, ethnic minorities, and marginalized local communities.

The role of local communities and their cultural diversity reflected in their ways of knowing is my topic here. And a closer attention to those cultural practices and local ways of knowing reveals the microfabric of what passes muster as “scientific knowledge.” Or so I will argue.

3. The right to participate in science as an epistemic-cultural human right

In some of my earlier work (Massimi 2024a), I have called the right to science an “epistemic-cultural” right, namely “a right concerning scientific knowledge (*episteme* in ancient Greek) qua part of wider cultural practices” (ibid. 143). I want to return to and expand on this idea in what follows.

As already mentioned, in the report entitled “Right to Participate in Science,” the UN Special Rapporteur on Cultural Rights (Xanthaki 2024) has articulated and justified this

¹⁴ For a take on this debate from, for example, the standpoint of the LGBTQIA+ community in Taiwan, Hong Kong, and Singapore, see Po-Han (2016).

¹⁵ Often philosophers have appealed to the notion of “human dignity” as the foundation of human rights, but even that notion has been questioned (see, e.g., Waldron 2015).

important participatory aspect of the right. The report is very explicit in avoiding exclusionary processes (section 2) and in understanding science “in an open and inclusive manner ... [to] include traditional knowledge, Indigenous science” (item 25), and with explicit reference to my own contribution, the report recognizes the importance of scientific diversity (section 3), that is,

acknowledging that scientific knowledge is produced by communities that are historically and culturally situated. That means understanding sciences in the plural form, from various traditions and cultural backgrounds, in various languages and following diverse ways of researching and carried by a variety of scientific or epistemic communities, from very local ones to cross-cultural ones. (Ibid., item 30)

The importance of the right to science so understood for enhancing participation in climate adaptation and mitigation policies has also been stressed more recently by the UN Special Rapporteur on Climate Change, Elisa Morgera (2024).

In my book on perspectival realism (Massimi 2022), drawing on the work of feminist philosophers of science, the situated knowledge thesis, and the wider history and philosophy of science tradition, I stressed how scientific knowledge is always historically and culturally situated: it is the product of particular communities at particular historical times and within the cultural resources and practices available to them. This plurality of scientific perspectives, far from being an obstacle to scientific inquiry, is in fact the very driving engine behind its reliability, I argued in detail.

In following work (Massimi 2024a), I have emphasized how this requires having a notion of expertise broad enough to encompass this plurality of situated practices, especially when dealing with practices whose reliable knowledge is oral rather than written, experiential rather than codified in curricula—in other words, what in my book, building on Canagarajah (2002), I called “local knowledge.” What is *philosophically* distinctive about local knowledge? And what has the right to participate in science got to do with it?

Against the backdrop of an increasing interest among philosophers of science in local knowledge and important work being done in transdisciplinary philosophy of science in this

direction,¹⁶ in the next section I tackle what seems to me to remain a *philosophically* rather understudied phenomenon: namely, what are the distinctive *epistemic features* of local knowledge?

I distinguish among three broad varieties of local knowledges, illustrating each variety with specific examples. In so doing, I hope to demonstrate how a better philosophical understanding of local knowledges is key to realizing the participatory dimension of science captured by the human right in question.

4. Three varieties of local knowledges

Suresh Canagarajah has used the term “local knowledge” to refer to knowledge that is “context bound, community specific, and nonsystematic because it is generated ground up through social practice in everyday life” (2002, 244). This is a useful starting point to define the notion to which various STS and postcolonial studies scholars have further contributed (see Mignolo 2000; and for a criticism, Temin 2024).

Surprisingly, in the philosophical literature (I have in mind here the epistemology of science mostly), the notion of local knowledge has not attracted much attention. STS scholars with leanings on critical theory and postcolonial studies have mostly drawn from the literature in anthropology and global cultural studies, where local knowledge has been illuminatingly studied in a variety of ethnographic settings and case studies. But, as of today, there is a visible absence of *epistemological* analyses about local knowledge. The notion is typically taken for granted, often taken off the shelves of the anthropological literature, and used loosely to describe very different situations. What follows is my attempt to fill this lacuna, coming as I do from the angle of the epistemology of science (my personal disclaimer).

As I see it, there are at least three main varieties of local knowledges (this list is meant to be neither complete nor exhaustive), and understanding what is unique to each of them, how they relate to one another, as well as how they differ from one another is important as a

¹⁶ Harding (1998); Wylie (2015); Kendig (2020); (Leonelli 2024); Ludwig and El-Hani (2020); Baker et al. (2024); Ludwig et al. (2024); (Parke and Hikuroa 2024). In epistemology, see Pavese (2023). See also the participatory citizen science work done by Montuschi and colleagues: <https://iseedeurope.eu/publications/>

way of clarifying some often-found ambiguities and unclarities on the topic. I will call these varieties as follows:

- I. Local knowledge as *place-bound knowledge* (LK.I)
- II. Local knowledge as *place-based knowledge* (LK.II)
- III. Local knowledge as *place-indexed knowledge* (LK.III)

To be clear, these three varieties are interconnected, as I will explain; they are all rooted in practice; and the differences among them become salient in different research contexts in which questions about local knowledge emerge and become important. The purpose of the framework I am presenting is not to sharply demarcate the three varieties, and certainly not to suggest that they are mutually exclusive. In relevant contexts, there might be examples of local knowledge that can be examples of more than one variety at once. In those situations, it is important to recognize the intersectionality of the local knowledges at stake. When there is no intersectionality, it can likewise be useful to consider each of these varieties in its own right, and not jumble them together.

For my purpose here, I will highlight the relevance of each variety to the *participatory* aspect of the human right to science and related human rights. I will also address the perennial risk of epistemic injustices associated with neglecting, overlooking, disparaging, or belittling these forms of local knowledges.

Starting with LK.I, at a broad general level, local knowledge can be understood as knowledge that is *place-bound* (or, as Canagarajah calls it, “context bound”) in the sense of pertaining to communities that occupy a particular historical and cultural place. *Situated knowledge* comes closer to describing this variety of local knowledge. Most of the examples I discuss in Massimi (2022) fall into this category.

For example, Hebridean kelpmakers of the eighteenth century displayed local knowledge qua *situated knowledge* in that they possessed knowledge of a distinctive practice of producing ashes rich in soda and potash from seaweed by harvesting the seaweed, drying it, and burning it in kilns. The ash was then given to the local landowner, who would sell it to

glass manufacturing companies, among others,¹⁷ making profits and with very meager financial returns for the Hebridean crofters, whose manual labor and experiential know-how about the practice was key to its success and to the wealth of the landowners.

Or, to use another of my examples from Massimi (2024a), contemporary Italian beekeepers have local knowledge qua *situated knowledge* of the practice of taking care of apiaries and making honey. Such practice includes knowledge of the api-botanical cycle as well as knowledge of associated practices like transhumance (moving hives up to the mountains in the hot summer months), among others.

Or, to give another example, the situated knowledge of people living with AIDS has historically been a turning point in medical research since the Denver Principles of 1983 (Advisory Committee of the People with AIDS 1983) in empowering people to have their voice heard and not be scapegoated, or treated as “victims” or “patients.” The “Nothing about us, without us!” norm that became part of UN policy briefing in matters of public health (UNAIDS 2007) led to community advisory boards that became involved in setting the research questions for HIV research, reviewing protocols for drug testing and safety assessments.

A similar effort has been under way for patients with tuberculosis and hepatitis C championed by organizations such as Treatment Action Group (TAG) in the aftermath of the previously successful campaign for people with AIDS. The situated experiential knowledge of people with TB involved in biomedical decision making via Community Advisory Boards (TB CAB) has led to a number of significant shifts in policy and medical research protocols, such as extending drug trials to adolescents and pregnant women, and testing for side effects and toxicity for new drugs rather than primarily for their effectiveness (see Frick, Henry, and Lessem 2016).

As these examples show, what makes these forms of knowledge *place-bound* is not “place” qua geographical location (Hebrides vs. Italian Alps vs. Denver) but rather “place” qua positionality, as per the “situated knowledge thesis” familiar from feminist literature

¹⁷ This practice was described among others by S. Johnson and Boswell (1775, 66). I discuss this practice in Massimi (2022, Ch. 10), in the context of electromagnetic researches at the time of J.J. Thomson.

(Wylie 2003). Under this first variety of local knowledge qua place-bound knowledge, I include *knowledge of practices* mostly (e.g. kelpmaking, beekeeping, pharmacovigilant practices). Such knowledge is *experiential* in that it is obtained from *lived experiences* (as opposed to, say, learned from books, or by taking a university degree in marine science, entomology, or medicine). I understand the notion of situated practices very broadly here to include not just things that people *do* (e.g. burning seaweed in kilns) but also what *gets done* to people (e.g. administering antiretroviral drugs).

There is something unique about *experiential knowledge of some practice* in that it is dynamic, adaptive, and responsive to changes. The crofters learn quickly when seaweed does not grow anymore on a rock. Beekeepers know when the time comes to move the apiary up the mountains because of the dry summers. People living with HIV know when a drug fails to address symptoms, and whether or not the side effects and toxicity of the drug are counterbalanced by the effectiveness of the drug.

Another variety of local knowledge (LK.II) is what I referred to as *place-based knowledge*. The local knowledge in this case can be best understood as knowledge based on, or grounded in, a culturally identifying world-system. This is not just experiential knowledge of situated practices, it is also knowledge of some natural phenomena—animals, plants, minerals, rivers, forests, and so forth—that are for that community akin to what Garibaldi and Turner call “cultural keystone species” (CKS)¹⁸ entangled with those practices.

A CKS denotes plants or animals or similar “that form the contextual underpinnings of a culture, as reflected in their fundamental roles in diet, as materials, or in medicine. In addition, these species often feature prominently in the language, ceremonies, and narratives of native peoples and can be considered cultural icons” (Garibaldi and Turner 2004, 1). The knowledge of such natural phenomena is *place-based* in being inextricably entangled in a web of spiritual beliefs, cosmogonies, and cultural world-systems concerning the land, rivers, and oceans interlinked with the ancestral origins of a community. What is often

¹⁸ See Garibaldi and Turner (2004). For a critical review concerning the limits in the applicability of the CKS framework, see Coe and Gaoue (2020). And for a discussion about the mismatch between the ecological centrality and the cultural centrality of a given species and the need to emphasize the latter over the former, see Cristancho and Vining (2004).

(inappropriately) referred to as Traditional Ecological Knowledge (TEK)¹⁹ or as knowledge by Indigenous Peoples and Local Communities (IPLCs) in the UN Convention on Biological Diversity (CBD) falls into this variety of local knowledge qua LK.II.

This is an area where STS and postcolonial scholars (often drawing from Latour and Stengers's pluriverse²⁰) have stressed the importance of onto-epistemic pluralism, namely ontological pluralism inherent in epistemic pluralism. Following (Parke and Hikuroa 2024), an apt expression to capture this complex onto-epistemic pluralism is “Indigenous ways of knowing, being, and doing” (IKBD). In UN legal documents (such as the BBNJ Agreement²¹), often this variety of local knowledge (LK.II) is captured by the so-called “ecosystem approach” as a framework for understanding and “braiding” Indigenous knowledge and Western knowledge in areas such as environmental sustainability and ecology management.²²

Just to give one example here, consider the local knowledge qua place-based knowledge of the Jeju women divers in South Korea. This community, who live on the island of Jeju, have a distinctive cultural practice of diving that UNESCO has recognized in the list of world Intangible Cultural Heritage (ICH).²³ That practice is also entangled with ecological knowledge of plants and animals, including, for example, *gelidium* seaweed, sea urchins, and sea turtles. The latter are sacred animals in Jeju cosmogony and an integral part of how the Jeju relate to the sacrality of the ocean and the ecological protection of its inhabitants.²⁴

¹⁹ The terminology remains controversial as “traditional” might erroneously suggest static or not dynamically evolving and progressing (see Sunder 2007).

²⁰ See, e.g., Latour (2004) and Stengers (2005).

²¹ UN Agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction, also known as the Biodiversity Beyond National Jurisdictions (BBNJ) Agreement, was agreed in March 2023 (see UN 2023).

²² For a discussion of the ecosystem approach in ocean governance, see Massimi, Brown, and Jaspars (2024).

²³ See <https://ich.unesco.org/en/RL/jeju-chilmeoridang-yeongdeunggut-00187>.

²⁴ “The Jeju share with the people of Ryukyu Islands in nearby Japan the belief in the existence of an oceanic paradise from which three princesses drifted on the shore of the ancient land of Tamna-guk marking the start of the Jeju people (Heo and Lee 2018). To these days Jeju women divers culturally identify sea turtles with ocean deities and follow a series

In this example, what is distinctive about this second variety of local knowledge is its *culturally identifying function*. Place-based knowledge of particular plants, animals, minerals, and so forth is not (and should not be) decontextualized from the rich web of spiritual beliefs and extracted and commodified for the purpose of, for example, ecological projects. This is not just experiential knowledge of a practice, but a much more holistic type of knowledge. It includes situated practices and their wider culturally identifying cosmogonic nexus, where the interrelations and interdependencies between human agents and other nonhuman agents (be they sea turtles, seaweeds, oceans, rivers, or trees) speak to the *place-based* nature of the knowledge in question.

What is unique about LK.II is not only its dynamic nature in response to environmental stress and climate change, but also the fact that it contributes to defining the unique cultural identity of, for example, the Jeju (in a way that, say, the situated practice of beekeeping—be it by Yucatán, Scottish, or Italian beekeepers—per se does not). This is *not* to deny that in some suitable contexts LK.I may in fact be grounded in LK.II, or intersect with LK.II, as I will explain below. But for reasons that will soon become apparent, it is important not to generalize and conflate these two varieties.

Turning to the third variety (LK.III) of local knowledge, this is best thought of as simply knowledge *of a place* or *place-indexed* knowledge quite literally in the geographical/spatial sense. Most of the examples found in the Third Wave of STS on so-called “lay expertise” or “citizen science” (Collins and Evans 2002) fall into this third variety. For instance, Wynne’s famous example of Cumbrian sheep farmers and their knowledge about specific grazing patterns in the aftermath of the Chernobyl nuclear disaster in 1986 belongs to this third variety of local knowledge (Wynne 1992, 1883). The certified experts in radioactive scores sent by the UK government to check the level of radioactivity and risk assessment for public health disregarded the local knowledge of the Cumbrian sheep farmers,

of culturally informed protocols in their marine encounters with turtles. For example, if a turtle is encountered by chance during diving, sea shells have to be offered to the turtle. And when a turtle is found dead on the shore, complex rituals are performed to send the turtle back to the ocean wrapped in sacred cloths (Kang 2017)” (Massimi, Brown, and Jaspars 2024).

which was key to understanding whether or not radioactivity might have entered the milk-food chain.

Another poignant example (Barrotta and Montuschi 2018) is the knowledge of the local inhabitants in the context of the Vajont dam disaster in the region of Veneto (Italy) in 1963. Such knowledge (about local tremors, cracks in the landscape, and a previous landslide in nearby Monte Toc) was overlooked and disregarded by the engineers²⁵ when the dam was built, at a huge cost. On October 9, 1963, a massive landslide from Monte Toc filled the Vajont dam reservoir, displacing the water within seconds into the downstream valley and wiping out the village of Longarone. Almost two thousand people were killed in what soon became one of the worst environmental disasters in Italian history.

What is distinctive in these examples is neither the experiential nature of the knowledge in question, qua knowledge of a historically and culturally situated practice, nor its culturally identifying function. Instead, LK.III can be better thought of as *place-indexed* knowledge or knowledge of *a place here and now*: for example, this patch of grazing grass on the Cumbrian hill *there and then*; or those cracks in the geomorphological structure of Mont Toc *there and then*.

As this overview has hopefully made clear, these are substantive *epistemic* differences among these three varieties of local knowledges that are often infelicitously glossed over at the cost of blurring distinctions and making sweeping unsupported generalizations about the importance, value, but also limits of local knowledge. In the next section, I clarify some of their subtle interrelations and intersectionalities.

²⁵ “Possessing general chemical, physical, geological knowledge did not ipso facto entail relevant information about the impact of a specific environment on the rocks in question, and about the particular reaction of these particular rocks to that impact (i.e. a potential non-linear behaviour of limestone in the circumstances). In a word, the first thing that was missing from Carlo Semenza’s choice of action was awareness of the role of *local knowledge*” (Barrotta and Montuschi 2018, 391–92, emphasis in original).

4.1 Interrelations and intersectionalities among varieties of local knowledges

While LK.II a fortiori entails LK.I (because it almost presupposes it), the converse is not necessarily the case. There are situations where LK.I does entail LK.II. And there are other situations where LK.I does not entail LK.II.

An example of LK.I entailing LK.II is the experiential knowledge of the Hebridean kelpmakers, which is an expression of their wider knowledge of the seashore and the so-called “culture of the strand,” which included waulking songs (i.e. songs sung rhythmically by women while softening the wool) and Gaelic poems. There is a sense in which this place-bound knowledge of the practice of “kelpmaking” was continuous with the wider place-based Scottish-Gaelic culturally identifying knowledge of the Hebridean crofters.

Or, to give another example I discuss in Massimi (2024a), place-bound knowledge about beekeeping for the pre-Columbian Maya was linked to the wider place-based culturally identifying world-system and associated spiritual practices, of which *balché* (a hallucinogenic drink made with honey) was an intrinsic component.

But, as I mentioned, there are other situations where LK.I does not entail LK.II in any clear sense. For example, the place-bound knowledge qua experiential knowledge of, say, AIDS activists fighting to have their voice heard in clinical trials in the 1980s is not part and parcel of any cosmogony or wider onto-epistemology, at the risk of making dubious essentializing claims about particular groups and their experiential knowledges.²⁶ The experiential knowledge of activists in the United States advocating for what became known

²⁶ For these reasons, a word of caution is necessary in the often unqualified appeal to the “ontological turn” (see Holbraad, Pedersen, and Viveiros de Castro 2014) and to plural ontoepistemologies in the literature. While illuminating to understand IKBD as LK.II in my idiolect, it is important not to obfuscate distinctive epistemological nuances among varieties of local knowledges at the risk of “othering” the local knowledge in question. Unsurprisingly, some Indigenous scholars have warned against this risk. For example, the Hawaiian scholar Manulani Aluli-Meyer articulates the idea that specificity leads to universality, “not to be confused with uniformity—America’s answer to diversity. Universality is a fundamental spiritual truth exemplified in harmony, peace, and awareness. This can only occur through respect and honoring of distinctness, thus the idea that ‘specificity leads to universality’” (2013, 149, fn. 1).

as the Denver Principles²⁷ was not that different from the experiential knowledge of activists in South Africa fighting against the HIV denialist public health policy of former President Thabo Mbeki and associated obstruction in the rollout of antiretroviral drugs which is estimated to have caused the premature death of 330,000 South African between 2000 and 2005 (see Chigwedere and Essex 2010, 237).²⁸

In these examples, what makes LK.I a very valuable type of knowledge when it comes to, for example, pharmacovigilance has nothing to do with its being grafted into wider culturally identifying world-systems. Rather, it has to do with its being grounded in the lived experiences of these communities of people living with HIV virus, and very often subject to stigma, systemic discrimination, and structural social disadvantage.

Likewise, LK.II entails LK.III (e.g. knowledge of *these* sea turtles on the Jeju island *now*), but often only trivially so in that it is *not* the indexicality of the marine species in question that is salient to the local knowledge of the Jeju women divers, but rather the cosmogonic nexus of which the marine turtles are part.

By contrast, LK.III does not necessarily entail LK.II. Knowledge of radioactive contaminated samples of Cumbrian grass *there and then* does not have to be part of—and indeed was not part of—any culturally identifying cosmogony associated with LK.II for the Cumbrian sheep farmers.

In turn, LK.I entails LK.III, but often only trivially so. The situated knowledge of Hebridean crofters in the eighteenth century was in a way also knowledge of this particular variety of, say, bladderwrack seaweed *there* (in Lochboisdale) *then* (1758). But there is nothing special about the spatiotemporal indexicality in question (unless the context of inquiry is marine biology and the presence/absence of particular plant species in a region at a

²⁷ See

https://www.unaids.org/en/resources/presscentre/featurestories/2023/june/20230626_denverprinciples-40-years-on.

²⁸ For a comparison with a different and more successful public health policy by neighboring Botswana, see Wolff (2012, 75ff.). The positionality of living with AIDS intersects with additional positionalities here, for example living in a state with a history of apartheid; being a pregnant woman in a patriarchal society; and so on. Accordingly, there are more fine-grained and complex aspects to the experiential knowledge in question as it applies in each case.

historical time). Such indexicality does not necessarily help us understand the knowledge of the situated practice of kelpmaking anymore than does, say, knowledge of *Laminaria digitata here* (Isle of Skye) *now* (by local crofting companies that continue to harvest seaweed today, mostly for farming and agriculture).

By contrast, LK.III often presupposes LK.I. For *knowledge of a place* presupposes and requires as a precondition occupying a particular standpoint from which such knowledge can originate. But, once again, this is not always and necessarily so. One can imagine a marine biologist acquiring LK.III of *this* sargassum seaweed *here* (at a particular location in the Atlantic Ocean) and *now* during biodiscovery research, without necessarily being part of any local coastal community and their situated knowledge.

Understanding and coming to appreciate these differences is important for identifying barriers and failures in the participatory mechanisms through which these varieties of local knowledges matter for reliable knowledge production and therefore for the right of everyone to participate in science. What is more, as I am going to briefly show next, such barriers and failures affect the implementation of the right to participate in science at the critical juncture where it meets other important human rights. In what follows, I take a closer look at how some of these varieties of local knowledges are critical for the implementation of the right to food (section 5.1) and the right to clean water, and to some extent also contemporary debates about rights of nature (section 5.2).

5. Reinstating local knowledges in policy making within a human rights approach

5.1 From the right to participate in science to the right to food

Back in 2011, the then UN Special Rapporteur on the Right to Food, Olivier De Schutter, saw the right to enjoy the benefits of scientific progress “not as an end in itself. Rather, ... [as] a means for the broader goals of human development and the full realisation of human rights” (2011, 308). In particular, in relation to the right to food, which is recognized in ICESCR Art. 11, De Schutter noted how despite widespread appeals to biotechnology and seed banks to address the global food crisis since the so-called “Green Revolution,” the regime of intellectual property rights to protect patent holders for biotechnological innovations was putting “in jeopardy the farmers’ seed systems, on which

most farmers in developing countries still rely and which, for these farmers, are a source of economic independence and resilience in the face of threats such as pests, diseases, or climate change” (ibid., 312).

Fast forward a decade, a lot remains to be done on the front of protecting smallholder agriculture against the oligopoly of biotechnological corporations and seed banks. In the latest report in 2022, the current UN Special Rapporteur on the Right to Food, Michael Fakhri, highlighted how the global market was still dominated by four main agrochemical companies that “control 60 per cent of the global seeds market and 75 per cent of the pesticides market” (2022, item 18). Fakhri advocated for the right to seeds but also for the protection of “traditional knowledge” (sic), and the protection of the right of smallholder farmers to participate equitably in benefit sharing and decision making (ibid., item 46(a)–(e)).

There have been undeniable advances brought about by biotechnology-improved seeds for crop production globally. Yet the centralized seed banks system has turned out to have its own limits when it comes to so-called “vertical programs” designed to improve crop efficiency in smallholder agriculture in marginal areas. Often the improved seeds only work in the presence of rich soils and plenty of water supply, conditions that are commonly absent (see also M. K. Johnson et al. 2021). Moreover, this centralized approach has negatively affected diversity in seed range,²⁹ making seeds more vulnerable to pests and parasites, and producing poor crop outcomes in many already deprived regions.

This is an area where the role of local knowledge qua *place-bound knowledge* (LK.I)—in conjunction with place-based knowledge (LK.II) in relevant intersectional contexts where LK.II might also apply—can make a real difference. Such *experiential knowledge* of many locally effective *practices* is often held by women in smallholder farming communities. They know, for example, how to visually and manually select seeds, and how to best preserve them given the local climatic and hydrological conditions.

For instance, according to a study carried out in the village of Namtumbo in Tanzania, which has a population with a Muslim majority of small farmers, local women select maize seeds by checking “haptically whether the corn is sufficiently dried through and firm”

²⁹ The centralized seed system has often de facto excluded traditional seed varieties, “since these are normally not genetically homogeneous enough to meet the requirements for approval and certification” (De Schutter 2011, 345).

(Metzger 2023, 114). Traditional farmsteads are the hub of a series of local agricultural practices finetuned over centuries. One of these women-led practices consists in preserving the seeds by hanging corn cobs upside down on a bamboo pole suspended from the kitchen ceiling. The external leaves remain attached to the cobs which are hanging above the open fire, both of which effectively protect them from insects and pests.

This is one example of how LK.I applied to seed selection and seed storage can make a greater real difference to local agriculture than biotechnology-enhanced seeds being parachuted into local communities in remote areas. But it is also an example of LK.I entailing LK.III, qua knowledge of specific types of seeds whose resilience to weather and pests *here* (Namumbo) and *now* matters for the livelihood of the community.

However, as I said above, often LK.I entails LK.III only trivially, in the sense that the emphasis is (and ought to be) on the *knowledge of a particular practice* for selecting, storing, and protecting seeds, knowledge that is situated in the sociocultural context of the rural life in the village of Namumbo and the role of women in running farmsteads. Particular forms of epistemic injustices arise when institutional organizations and international certification bodies either unwittingly conflate or willingly trade on the ambiguity between LK.I and LK.III.

Such epistemic injustice manifests itself in the form of a credibility deficit ascribed to LK.III. Often in the name of exacting scientific standards when it comes to the identification and selection of high-quality seeds, attention gets shifted away from the contextual circumstances for the successful use and deployment of such seeds in marginal geographical areas, which is precisely the strength of LK.I. Trading on the ambiguity between LK.I and LK.III has, then, the net result that the situatedness of knowledge, which matters most in this agrarian context, is swept under the rug. This is illustrated by the following example.

Increasingly, participatory plant breeding (PPB) systems have been adopted in various countries with the aim of taking seriously the voices and perspectives of the local rural communities that are often left out in the logic of the global centralized seed banks. PPB involve a number of methods where agrarian researchers and local farmers collaborate “to bring about plant genetic improvement within a crop” (Morris and Bellon 2004, 25). In

addition to favoring genetic diversity of seeds, such methods prove more effective in reaching smallholder farmers in poor rural areas.

Yet PPB methods continue to face serious institutional challenges, including a credibility deficit. Lack of statistical methods in the analysis of data and overreliance of haptic properties (deemed subjective and not scientific) such as texture, taste, and aroma mean that not just plant breeders but also regulatory authorities in various countries and agrochemical corporations in the global market often sneer at seed varieties obtained from PPB methods.³⁰ This in turn perpetuates cycles of injustice in how smallholder rural communities continue to be cut out of the global centralized seed bank systems and its eye-watering profits.

In this case, the credibility deficit seems to go hand in hand with the surreptitious assumption that all there is to smallholder farmers' local knowledge is de facto what I called LK.III. Namely, their local knowledge is reductively (and mistakenly) identified with sheer indexical knowledge of *these seeds here and now* and associated haptic (hence "subjective" and "unscientific") knowledge of their texture, aroma, and so forth.

This reductive identification of their knowledge as sheer indexical *knowledge of a place* (e.g. and its local seeds) *here and now* misses the main point about the value and significance of their knowledge qua *experiential knowledge* of particular situated practices whose track record of reliability for crop success has been hard-won. Selecting good seeds and being able to protect them against harsh weather conditions and in the absence of large supply of water is not a matter of passing a statistical test. It is a matter of life or death for the very people in the community at stake. It marks the difference between having a healthy crop or not having a crop at all on a seasonal basis.

This epistemic injustice is what in Massimi (2022) I have referred to as epistemic severing and epistemic trademarking: that is, the institutionalized tendency to *sever* knowledge of marginalized communities (maybe because oral rather than written, experiential rather than certified) and to *trademark* portions of knowledge (e.g. knowledge of seed quality) as the repository of particular Western practices.

³⁰ See (Morris and Bellon 2004), 29–30, for a discussion of the credibility issue.

This is an area where I think the discussion so far on the right to participate in science can make a difference to discussions concerning the implementation of the right to food. The right of these rural communities to equitably share in the benefits of seed systems, and their right to participate in decision making concerning such systems, is entangled with the protection of their right to participate in science. And crucially, if the analysis in this article is on the right track, such a right should not be understood according to a one-way deficit model, whereby the rural community simply has a right to *access* the scientific knowledge of plant breeders working for the Big Four agrochemical companies. To be clear, such a right to access is also important (and it also falls under the right to science) and must be protected against widespread use of patents and intellectual property rights that make such access financially prohibitive, and often in practice impossible (unless patents are waived).

My point is that, in addition to such a right to access, there is a further *participatory* dimension to the right to science for these smallholder farmers, which is the one I have advocated in this article. Namely, they have the right to have *their own local, reliable ways of knowing* recognized as a legitimate and credible source of knowledge *in its own right* when it comes to seed selection and storage and methods. These varieties of local knowledges should be given due consideration as legitimate, credible, and time-tested forms of knowledge, especially in marginal disadvantaged areas where statistical methods and industrial-scale plantbreeding “vertical” programs have abundantly failed.

5.2 From the right to participate in science to the right to clean water and rights of nature

But epistemic severing and trademarking manifest themselves also in different contexts where it is very often the *place-based* nature of LK.II that gets severed and discarded. One of the starkest examples of this form of epistemic injustice can be found in discussions concerning Indigenous water rights. Here I recognize my positionality as a white European woman. Authoritative studies led or codeveloped by Indigenous scholars exist on the matter, and the best I can do is to refer the reader to them (see, e.g., Leonard et al. 2023). For example, the concept of Water Rematriation³¹ has been introduced to stress how water

³¹ “Rematriation is a term coined to reinvigorate and inspire humanity to fulfil its duty of care for Mother Earth. ... It further describes the process of returning Water, Land, culture, and

sovereignty is entangled with Indigenous cosmogonies where waterways play a key culturally identifying role that is often neglected, willfully ignored, or intentionally sidelined in colonialist narratives.

These activist efforts find their legal counterpart in the 2023 UN report on the human right to safe drinking water and to sanitation (Arrojo-Agudo 2023). The report paints a rather grim overall picture of the global challenges caused by environmental pollution of groundwater, rivers, and oceans. It also highlights how centuries-long processes of appropriation of the land and economic extractivism have often led to widespread “water grab.” Moreover, the report stresses the “legal personality of aquatic ecosystems” and recognizes the need to promote “a participatory and responsible culture,” which in turn “requires education, information and training policies on water management for the entire population.”

In human rights law, the duty bearers are usually state parties, who have to respect, protect, and fulfil the rights. Appeal to the human right to a clean water and sanitation is not just entangled with defending the rights of smallholder farmers to their own local precolonial knowledges, practices, and techniques of irrigation systems—whether in Honduras, Kenya, India, or anywhere else (see, e.g., Davies, Kipkeu Kipruto, and Moore 2014). It is also becoming increasingly vital to defending the water rights of IPLCs.

Historically, egregious water appropriations are entangled with systematic processes of institutional neglect and scientific downplay of LK.II when it comes to ecological policies, agrarian reforms, and even risk assessments. Worse, LK.II is often the target of “culture wars” by state governments, which blatantly tend to diminish its value and misunderstand its wider significance.

Consider as a further related example the so-called “rights of nature”³²—long championed by the Earth Jurisprudence movement (see Koons 2009), enshrined in Bolivian

spirituality to Indigenous women to address the ongoing impacts of colonialism, patriarchy, and gender-based violence” (Leonard et al. 2023, 379).

³² See <https://www.theguardian.com/environment/2024/jan/01/could-2024-be-the-year-naturerights-enter-the-political-mainstream>.

and Columbian national jurisdictions,³³ and increasingly appealed to at the local regional level also in Canada and the United States. At a recent UN meeting, representatives for the UK government³⁴ reportedly claimed that “rights can only be held by legal entities with a legal personality. We do not accept that rights can be applied to nature or Mother Earth.” This reply conceals a spurious assumption.

The spurious assumption seems to be that groundwater, waterways, rivers, and oceans— but also trees and forests—cannot in principle be legal entities with a legal personality whereas banks, corporations, churches, and even ocean-going vessels can (and typically do) count as such legal entities under various national and international jurisdictions. This is spurious because there is no principled reason why a vessel can (but a river cannot) count as a legal entity. It ultimately comes down to a decision to allow the former to be (and disallow the latter from being) enshrined in national or international legally binding documents.

There is more. This spurious assumption in turn masks once again epistemic injustices in how particular varieties of local knowledges, in this case place-based knowledge, tend to be downplayed and severed in dominant narratives. State officials and government representatives can easily come around to the view that local qua *place-indexed* knowledge LK.III can be an asset in understanding complex ecosystem dynamics and associated environmental risk—be it knowledge by Cumbrian farmers in the aftermath of Chernobyl, or knowledge by Pennsylvania green activist groups about the pernicious effect of fracking in Tamaqua city ordinance (see Borràs 2016, 137–38).

Yet things are different when dealing with local qua *place-based knowledge* (LK.II). In this case, especially in the context of international law when dealing with place-based knowledge of IPLCs, for whom such knowledge is *culturally-identifying*, the tendency is to retreat within one’s own geopolitical jurisdiction. Worse, the tendency is to camouflage one’s own political stance behind the fig leaf of one’s own ontological and cultural worldview.

³³ However, the implementation has been a lot more patchy and plagued by political volatility and colluding political interests and interferences by large international corporations (see Borràs 2016). On the topic of rights of nature, see also Rickard and Ludwig (2024).

³⁴ See <https://www.theguardian.com/environment/2024/feb/22/uk-government-can-neveraccept-idea-nature-has-rights-delegate-tells-un>.

This is where the greatest risk of misuse and abuse of LK.II lies, in my view. Varieties of place-based knowledges often become unwittingly the target of “culture wars” and are dismissed in the name of unqualified and unsubstantiated cultural relativism—as if it were a matter of incompatible or incommensurable worldviews whether or not such rights of nature (including water rights) can be legally recognized in international law.

Such a response is not just disrespectful and colonialist. Epistemic severing and trademarking run deep behind it. For it tacitly accepts that the situatedness or place-bound nature of the knowledge (LK.I) afforded by local communities in specific places (e.g. Cumbria, or Tamaqua city district—examples of LK.I entailing LK.III) matters for the legislative purpose of protecting the local ecosystems and public health.

Yet it rejects that the same situatedness or place-bound nature of knowledge (LK.I) matters for the purpose of protecting water security and livelihood of local communities in relation to, say, the contamination of waterways in the Murray-Darling Basin in Australia (another example of LK.I entailing LK.III), which is sacred to forty Indigenous Nations (an example of LK.II a fortiori entailing LK.I, which in turn entails LK.III).

In other words, some perverse misuses and abuses of varieties of local knowledges are sometimes at play when dominant narratives selectively sever the broader culturally identifying *milieu* which often grounds examples of local knowledge LK.I and LK.III whenever relevant. The ensuing local knowledges LK.I and LK.III are then presented as a “trademark” or repository of particular communities at the expense of others, whose local knowledge being grafted into their *other* cultural ways of knowing, being, and doing (i.e. being an instance of LK.II) is accordingly severed and discounted.

These forms of epistemic severing and trademarking mask once again a pernicious attempt at reifying culturally identifying forms of local knowledge into essentializing group notions (*our* worldview vs. *their* worldview).³⁵ Such reification is self-serving for contemporary right-wing “culture wars” against Indigenous water rights and rights of nature. Historically, it was self-serving for fascist propaganda in the way in which romanticized and

³⁵ For a criticism of such essentializing tendencies, see Kurzwelly, Rapport, and Spiegel (2020)

reified forms of *place-bound* knowledge (e.g. by Italian smallholder farmers happily harvesting wheat) were misused and abused for racist and populist programs.

6. Conclusion

To return one more time to my topic here, the right to participate in science once suitably understood to encompass varieties of local, reliable ways of knowing is a key tool for the implementation of a variety of other human rights. In this article, I have confined my attention to the right to food and the right to clean water as two main examples, and rights of nature as a potential third example. Getting clear on the relevance and significance of varieties of local knowledges is key to overcome stand-offs that too often have pitted rights-based approaches against responsibility-based approaches, Western science against traditional ecological knowledges, and the universalism of human rights against the cultural relativism of values. The emphasis on “participation” is important to underline how science is an open-ended process of reliable knowledge production to which all human beings, including smallholder farmers in Tanzania, Hebridean crofters, Italian beekeepers, people living with HIV, and Jeju women divers in South Korea, have an equal and inalienable right to participate in, each with the unique sets of skills and knowledges distinctive of each community and their situated practices.

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