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Editorial

How can we better account for experiential knowledge in co-production frameworks?

A B S T R A C T

Calls for co-production at the environmental science-policy interface emphasize broad participation and inclusion, yet they continue to privilege knowledge aligned with Western scientific standards over other ways of knowing. This editorial argues that experiential knowledge—embodied and affective understanding rooted in lived experience and often communicated through vivid storytelling—remains largely unrecognized and undervalued in co-production frameworks and initiatives. Drawing on insights from philosophy, narrative theory, and neuroscience, we examine how storytelling enables the transmission of experiential knowledge through aesthetic engagement and embodied simulation. We distinguish between using anecdotes as illustrative tools and crafting narratives that convey the full affective and sensory texture of experience. The article proposes non-extractive and epistemically inclusive approaches to account for experiential knowledge in research and policy, including strategies for inviting both analytical and aesthetic reading. We conclude with practical recommendations for valuing and respecting experiential knowledge, moving toward a more inclusive understanding of what counts as knowing at the environmental science-policy interface.

Preamble

We open this editorial not with scientific evidence, but with two rhetorical questions and a short story. These are not mere literary flourishes—they are the heart of our argument, told in a different register to help provoke a deeper level of engagement with the subsequent content.

Question 1. What is it about immersing ourselves in a story—whether told through fiction, memoir, poetry, song or film—that a summary simply can't capture? Why do we linger with the narrative, rather than just skip to the conclusion?

Question 2. When facing a complex dilemma, isn't it natural to turn to those who've lived through something similar—those whose experience offers more than theory ever could?

Silverleaf Story Imagined[1]

Ed Setliff didn't walk so much as shuffle these days—his feet crunching over pine needles, his gaze low, scanning the forest floor like a man still on the job, though long retired. The birches, pale and trembling in the wind, lined the edge of the university campus in Thunder Bay. Students hurried past, clutching laptops and coffee cups. None of them noticed the leaves.

But Ed did.

He stopped, narrowed his eyes, and reached for one—a curling, silver-streaked leaf. He turned it between his fingers, familiar as breath. It was a signature. A whisper from the trees. Silver-leaf, he thought. No one's looking for it here.

That moment stayed with him, like a thorn just beneath the skin. He couldn't let it go. A fruit tree disease, they said. Not relevant in the northern woods. But Ed had spent his life listening to the quiet signals of forest illness—rings of fungus at a trunk's base, the way bark peeled back in shame, how a tree leaned ever so slightly away from the wind.

And now the birches were dying.

They said it was age. Eighty years. Natural lifespan according to geneticists.

"Rubbish," Ed muttered aloud one day, alone in his study. He stood before a pile of aging research papers, pulling out old herbarium sheets and recent surveys, leaf samples brittle with time. "We decided birches die at eighty. But maybe we're the ones killing them."

He launched into the question like a man possessed: Could silver-leaf disease—Chondrostereum purpureum—be silently sweeping through birch forests, misread, overlooked, dismissed because birches aren't profitable enough to protect?

[1] The Silverleaf Story Imagined is a fictionalized account of an anecdote from an interview undertaken by one of the authors with Ed Setliff, a retired professor of forest pathology (Klenk, 2008). The anecdote was used to illustrate the point that forest pathology and environmental ethics are co-constitutive. The story is fictionalized here, but inspired by Ed's story, hence his experience has been "co-produced" in this fictional account, serving to give the reader a vivid understanding of Ed Setliff's complaint about the marginalization of forest pathology in the forest sciences in Canada as well as the ethical and relational dimensions of his research experience with the phenomenon of birch dieback.

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Ten years passed like the seasons—paper after paper, samples taken in sleet and sun, notes written in the margins of field reports, late nights lit by the glow of a desk lamp. His hands stiffened with age. His eyes tired. But still, he traced the presence of the fungus through herbaria in Canada, the U.S., Norway. Everywhere he looked, there it was. Not just in fruit trees, but in birch and willow too. The symptoms were subtler here—no dramatic silvering, no telltale fruiting bodies in full bloom—but the damage was real.

One year, in a slash pile left by loggers, Ed found the telltale bloom of basidiospores. A perfect storm: wounded trees, damp air, a feast of wood waste left to rot. He ran his finger along a felled birch, softening at the base, its core caving inward.

"We did this," he whispered.

There was no grant money, no flashy research team. Just Ed, his sharp mind, and the belief that even so-called "low-value" trees deserved a future. He saw them not as commodities but as living beings—storytellers of the boreal world. Trees that once stood in shimmering groves, filtering sunlight like stained glass.

And he saw something else too: silence. The kind that creeps into disciplines ignored by those chasing profit and prestige. Forest pathology had become a quiet backroom of science, elbowed aside by the shine of molecular genetics. But Ed kept speaking. For the birches. For the willows. For the trees deemed too common, too dispensable.

Sometimes, he felt like a relic. An old man chasing ghosts in the woods. But the ghosts were real. He'd seen their silver signatures. Heard the quiet decline.

At the end of our talk, I asked him—gently—if maybe birches were just reaching their natural end.

His eyes sharpened, the way I imagine they must have when he was younger. "They could live twice as long," he said flatly. "If we stopped hurting them. If we listened."

Ed Setliff never raised his voice. He didn't need to. The forests had spoken to him, and he answered with decades of careful, stubborn attention. In his quiet defiance, he gave voice to the voiceless, to a dying tree with silver leaves.

And sometimes, in the hush of evening, I imagine Ed still walks the edge of the forest, looking up into the canopy, listening for what we've missed.

1. Introduction

The co-production of knowledge has emerged as a central ambition at the environmental science-policy interface. Rooted in Science and Technology Studies (STS), the concept, in its original acceptation, draws attention to the intertwined nature of knowledge production and power. Since knowledge is power, it is important to account for the different ways of knowing that co-production privileges or includes. As Jasanoff (2004) famously puts it, co-production is "shorthand for the proposition that the ways in which we know and represent the world are inseparable from the ways in which we choose to live in it" (p. 2). This claim carries a normative imperative: if science and society are co-constitutive, then knowledge production is inherently shaped by societal norms, institutions, technologies, and power relations. Diverse ways of knowing are unevenly valued and legitimized, and knowledge co-production must be transparent and attentive to these asymmetries, ensuring that knowledge systems outside Western scientific norms are not further marginalized.

In practice, co-production has been taken up in various fields, particularly in sustainability research (e.g. Karcher et al., 2021), as a framework for collaborative and inclusive knowledge-making (Jasanoff, 2004; Wyborn et al., 2019). It promises a more democratic science—one that is pluralistic, accountable, and context-sensitive (Norström et al., 2020). Yet, despite this ambition, the literature on co-production has often prioritized scientific and policy-relevant knowledge at the expense of other epistemic forms (Turnhout et al., 2020). Notably, experiential knowledge—rooted in embodied, affective, and lived experience—remains marginal and tokenistic in many co-production initiatives (Klenk, 2024).

This editorial maps out different ideas to recognize and empower experiential knowledge more explicitly. Drawing on insights from philosophy, narrative theory, science studies, and neuroscience, we argue that experiential knowledge plays a vital yet underappreciated role in the co-production of knowledge. As a first step, we explore how narrative and aesthetic engagement offer a means of accessing and sharing this form of knowing, and why these modes of communication are essential for knowledge production that is inclusive and non-extractive. In doing so, we propose a framework for engaging with experiential knowledge on its own terms—one that does not reduce it to propositional summaries, but instead takes seriously its embodied, situated, and affective nature. This editorial also builds on previous calls to better legitimize and draw upon experiential knowledge within the realms of environmental science, policy and decision-making (e.g. Fazey et al., 2005; Cook and Sgrò., 2019).

The editorial begins by examining the conceptual foundations of co-production, tracing how its uptake has tended to emphasize participatory processes over epistemic diversity. We then distinguish between experiential and propositional knowledge, emphasizing how co-production at the environmental science-policy interface often privileges the latter. The next sections explore the philosophical and neuroscientific basis for understanding experiential knowledge, particularly through narrative and aesthetic engagement. Drawing on examples from science communication, Indigenous storywork, and environmental policy, we show how stories convey lived experience in ways that foster empathy, ethical reflection, and situated understanding. We conclude with seven practical recommendations for researchers and practitioners to engage with this form of knowledge more ethically, inclusively, and effectively in co-production processes.

2. The meanings of co-production: ontology versus methodology

The term co-production originated in Science and Technology Studies (STS) to describe the mutual shaping of science and society. Building on the work of many scholars - e.g. Foucault (1980); Ezrahi (1990); Latour (2012) - Jasanoff (2004) introduced co-production as an analytical idiom, aimed not at prescribing methods or tools, but at analyzing how knowledge, norms, and institutions produce each other. This framing was intended to address limitations in other social science approaches that often treated science as a discrete, autonomous domain. In contrast, co-production foregrounds the entanglement of epistemic and social orders, making visible the ways in which scientific facts and social norms are co-constituted and vary over space (e.g. in different countries) and time.

At the environmental science-policy interface, co-production has become both a normative ambition and a methodological approach to integrating diverse knowledge systems. For example, global change research programs such as Future Earth and expert institutions such as IPBES (the intergovernmental science-policy platform on biodiversity and ecosystem services), have promoted co-production as a means of ensuring that scientific knowledge is socially relevant, actionable, and responsive to the complex challenges of global change (van der Hel, 2016). In this context, co-production often refers to participatory processes that seek to engage a wide range of actors—scientists, policymakers, Indigenous communities, and civil society—in collaborative problem identification, framing and solving (Wyborn et al., 2019; Norström et al., 2020). This understanding of coproduction is different than in STS – where coproduction happens whether we want it or not,

and not necessarily to refer to participatory processes.

Indeed, this applied use of co-production tends to emphasize who participates and how, rather than power dynamics and what forms of knowledge are being integrated. Co-production is frequently treated as a process or method, rather than as a conceptual framework for genuinely interrogating social and epistemic assumptions (Bremer and Meisch, 2017). As a result, even when co-production initiatives aim for inclusivity, they often privilege scientific and technical knowledge while reducing other forms—particularly experiential knowledge—to secondary or supportive roles (Goldman et al., 2018; Muhl et al., 2023). Claims of inclusivity can also serve to legitimize the status quo, particularly when they involve integrating knowledge primarily from already powerful actors. This tension is particularly acute when integrating Indigenous or local knowledge systems, which are frequently reframed in scientific terms or selectively extracted for policy purposes (Latulippe and Klenk, 2020; Agrawal, 1995).

In this editorial, we focus specifically on knowledge co-production, a narrower but widely used understanding of the broader co-production concept. This form of co-production is especially prevalent in applied research contexts (e.g. review by Karcher et al., 2021), where it refers to the intentional inclusion of non-scientific actors in the generation of knowledge. While this approach aims to democratize knowledge production, it can also risk instrumentalizing alternative epistemologies if they are not engaged on their own terms. Our concern is that knowledge co-production, when uncritically applied, can reinforce epistemic hierarchies and risk legitimizing existing structures if they merely incorporate the perspectives of dominant actors without addressing underlying power imbalances (Cvitanovic et al., 2019). In particular, the dominance of propositional knowledge—a form of knowing based on abstract, decontextualized truths—can crowd out other valid ways of knowing, such as those grounded in direct, lived experience.

3. The missing concept of knowledge in co-production literature

Despite the prominence of the term co-production at the environmental science-policy interface, there remains a surprising lack of clarity around what is meant by knowledge (Klenk, 2024). Many contributions define co-production in procedural terms—who is involved, what the stages are, and how collaboration occurs—without offering a robust account of the epistemic content being co-produced (van der Hel, 2016; van der Molen, 2018; Wyborn et al., 2019; Miller and Wyborn, 2020; Gill, Arthur and Leng, 2023). As a result, much of the literature assumes a default understanding of knowledge as scientific, propositional, and generalizable, even when calling for epistemic plurality.

For example, Jasanoff's (2004) foundational formulation of co-production highlights how scientific knowledge contributes to the construction of social order, and vice versa. Yet the concept of knowledge itself remains implicit, and is often assumed to refer to scientific or expert understanding. Similarly, van der Hel (2016), in her analysis of co-production within Future Earth, focuses on how to co-produce knowledge—examining participants, methods, and motivations—without interrogating the nature of the knowledge involved. The knowledge is assumed to be that which science typically produces: abstract, transferable, and evidence-based.

Raymond et al. (2010) offer a more nuanced typology, distinguishing among scientific, local/experiential, and hybrid knowledge. Yet even here, the experiential dimension remains underdeveloped. They acknowledge the diversity of knowledge types—ranging from Indigenous and traditional ecological knowledge to tacit, implicit, or lay knowledge—but caution that categories like "scientific" and "local" can be overly simplistic. While they call for attention to how individuals make sense of information in specific social contexts, the analysis still centers on epistemic integration within an overarching scientific framework. The work of Evans and Collins (2009) does recognize different forms of expertise (e.g., tacit knowledge, credentials, experience, track-record), yet, situated against relativism it also conveys the idea that some forms of expertise are more valid than others.

More recently, scholars such as Bremer and Meisch (2017) and Wyborn et al. (2019) have emphasized the need to clarify what is meant by co-production to avoid conceptual ambiguity. Their work maps the different usages of the term across policy, science, and practice, highlighting tensions and overlaps. Yet even in these efforts, the epistemological foundations of knowledge itself are often left implicit. The emphasis remains on co-production as a method or process, rather than on the kinds of knowing it enables or excludes.

This is perhaps best illustrated by the work of Chambers et al. (2021) who systematically mapped 32 co-production initiatives in six continents across local to global scales. Their analysis showed that the purpose for utilizing co-production, and the extent to which co-production processes accounted for factors such as power and politics, varied significantly. As a result, they identified six modes of co-production commonly used in sustainability, each that came with their own risks and challenges such as creating echo chambers, reinforcing the status quo and processes being co-opted by powerful vested interests. In recognition of this, Chambers et al. (2022) called for what they term co-productive agility - "*the willingness and ability of diverse actors to iteratively engage in reflexive dialogues to grow shared ideas and actions that would not have been possible from the outset*" - arguing that this can open new pathways to (i) *elevating marginalized agendas* in ways that maintain their integrity and broaden struggles for justice, and (ii) *questioning dominant agendas* by engaging with power in ways that challenge assumptions, among others. Yet, despite this recognition, and calls to better account for ethical dimensions of co-production processes (Partelow et al., 2025), practical advancements in overcoming the risks and challenges persist and many knowledge forms remain only tokenistically included (or even intentionally excluded) from co-production processes. That is, despite growing awareness of co-production and its increased application across the globe in practice – proposition knowledge remains elevated and privileges at the expense of other knowledge forms.

4. Propositional and experiential knowledge

To move beyond the implicit privileging of scientific knowledge in co-production, we must first revisit a foundational epistemological distinction: that between propositional and experiential knowledge.[2] Propositional knowledge, often characterized as "knowledge-that," and represented by the formula "*s* knows *p*" where *s* is a subject and *p* a proposition (Abath, 2022), refers to factual or conceptual claims that can be evaluated as true or false (e.g., "water boils at 100°C"). It is abstract, generalizable, and typically communicated through language and symbols. This form of knowledge has long been the focus of Western epistemology and underpins the structure of most scientific discourse (Zagzebski, 1999; Benton, 2017; Duncan, 2020).

Propositional knowledge offers distinctive strengths: it supports logical coherence, analytical clarity, and theoretical generalization. It enables researchers to construct structured explanations and predictive models—essential tools in fields like climate science, where understanding complex systems and projecting future risk depends on abstract representation. For instance, it is through propositional reasoning that we came to theorize the existence of black holes, long before they were

[2] We acknowledge the risk of constructing an overly abstract binary distinction here, as an anonymous reviewer of a previous draft has helpfully cautioned us. Epistemology offers other distinctions as well, such as practical knowledge (know-how) (e.g., Abath, 2022). These categories are flexible and often overlap: it is possible to know something through propositions, experience, and practice simultaneously, and each form of knowledge can enrich the others. Nevertheless, distinguishing between propositional and experiential knowledge remains useful for bringing into focus a mode of knowing that has been buried by certain epistemological traditions.

empirically observed. Similarly, global climate models have been indispensable for illuminating planetary-scale tipping points and informing international policy targets. Yet the dominance of propositional knowledge can obscure the contextual richness and situated nuance necessary for grounded responses to environmental challenges. It often brackets out embodied, affective, and relational dimensions of knowing—dimensions that are crucial for connecting theory to practice in meaningful ways.

Experiential knowledge offers a contrasting epistemic mode. This type of knowledge has also been referred to as "knowledge by acquaintance" (Russell, 1910), "objectual knowledge" (Farkas, 2019), "knowledge of things" (Duncan, 2020; 2021), "interpersonal knowledge" (Benton, 2017), "knowledge by connaturality" (Maritain, 1951), "practitioner knowledge" (Bensimon, 2007), "phenomenological knowledge" (McGregor, 2016), or "tacit knowledge" (Polanyi, 1997; Evans and Collins, 2009). This lexical diversity contributes to the ambiguity surrounding experiential knowledge and a clear, comprehensive, and integrative account that bridges these various perspectives would be helpful in orienting research questions on how to effectively account for experience as a form of knowledge in co-production frameworks. For this editorial, we have chosen the term "experiential knowledge" for its explicit focus on experience, from which we can derive its main characteristics.

Experiential knowledge is rooted in direct, first-person engagement with the world. Philosophers such as Russell (1910), Dewey (1958), and more recently Duncan (2021) and Kukla (2023) have emphasized that this form of knowledge arises not from abstract representations but from lived, subjective experience. It is knowledge *of* something in its immediacy, not merely *about* it. As Russell (1910), 108) notes, we are acquainted with an object "when [we] have a direct cognitive relation to that object," unmediated by propositional inference. This kind of knowing is grounded in the "what it is like" quality of experience (Nagel, 2013; Puolakka, 2022)—a depth of understanding that cannot be fully captured through analytical models or linguistic description alone. Aubinet's (2022) work on the Sámi yoik, an Indigenous singing practice, exemplifies this distinction. Yoik is not simply a cultural artifact to be studied for its informational content; it is a mode of being and relating, a way of knowing the environment that defies semiotic and propositional boundaries. To know *that* a song is a form of environmental knowledge is one thing; to *sing* it is another. The act of singing—the embodied breath, the emotional resonance, the relational connection to land and community—constitutes a different epistemic register altogether. It is in the singing, not merely in the reflection about singing, that knowledge is made, shared, and lived.

However, stopping at this core characteristic — the 'what it is like' aspect of experiential knowledge — is too simplistic. Having a subjective experience encompasses many other important features. Some of the other characteristics of experiential knowledge are:

- *Embodiment*. Experience is rooted in a body that perceives, moves and interacts, and it is through this sensorimotor engagement that meaning and thought can arise (Johnson, 2007; Woodruff Smith, 2019). Experiential knowledge of an object, for example, is gained by manipulating it and perceiving it from all angles while moving around it, and different bodies with different abilities will enable different forms of experiential knowledge. Moreover, recognizing the embodiment of experience helps to recognize the situated nature of knowledge (Haraway, 2013) and the importance of positionality.
- *Affect*. Emotions are an integral part of subjective experience and to the knowledge inherent in it. Martha Nussbaum (1990) argued for the crucial role of emotions in the formation of ethical understanding and judgments, while Alexa Weik von Mossner (2017) specifically applies this train of thought to environmental knowledge. For example, the knowledge I have of a friend is shaped not only by shared facts, but by moments of joy and pain that we have lived through together.
- *Relationality*. Experience always involves an interaction between an active subject and an environment (Dewey, 1958). We are never fully separate from the world around us, nor from the networks of meaning in which we are embedded (Heidegger, 1962).

These characteristics of experiential knowledge intertwined; we have singled them out for didactic purposes. The key point to note is that although experience contains a propositional aspect, experiential knowledge resists simplification into propositional linguistic terms (Kukla, 2023; Eldridge et al., 2020). A proposition about an experience cannot fully capture the richness of experiential knowledge, particularly with regard to its subjective, embodied, affective, and relational aspects. For example, to say one "knows the forest" experientially means more than knowing its location or species composition. It means having walked its trails, perhaps stumbling over roots or pausing to observe the play of light through the canopy. It means having felt its humidity cling to the skin, smelled the earthy scent after rain, and heard the layered sounds - the rustle of leaves, the call of birds, the distant hum of insects. It may involve recognizing subtle seasonal shifts, knowing where mushrooms tend to grow after a wet spell, or sensing when a storm is coming by the behavior of animals. Experiential knowledge of the forest is embodied and relational - it reflects a dialogue between the person and the place, shaped over time through repeated encounters, emotional responses, and even memories. It is not just knowledge *about* the forest, but knowledge *with* the forest (see, Kohn, 2013; Critical Forest Lab 2024).

This kind of knowledge is deeply embodied and embedded—it cannot be fully abstracted without losing something essential. As Ingold (2011) argues, knowledge arises not from abstract detachment but from movement, attention, and dwelling in place. Similarly, Abram (1996) emphasizes that understanding the natural world depends on sensory immersion—a reciprocal relationship between human perception and the living land. Turner (2005), working in the context of Indigenous ecological knowledge, shows how forest knowledge is cultivated through long-term, place-based relationships grounded in observation, practice, and care. These perspectives remind us that experiential knowledge is not a lesser or preliminary form of knowing—it is a distinct epistemology rooted in embodiment, affect, and encounter, as in the case of the Sámi yoik described by Aubinet (2022).

Understanding the difference between these two forms of knowledge is crucial for co-production. Propositional and experiential knowledge are not inherently opposed; they can be complementary. But in practice, the dominance of the propositional often leads to the flattening of the experiential—translating lived experiences into data points or illustrative examples, rather than treating them as meaningful in their own right. Recognizing experiential knowledge as epistemically valid—and not merely anecdotal or affective—is a necessary step toward more inclusive and reflexive forms of knowledge co-production. Experiential knowledge, by contrast, arises from direct engagement with specific places, histories, and relationships. It enables embodied understanding, which not only bridges the abstract and the practical but also fosters emotional resonance and ethical attunement. These qualities—empathy, relational depth, and attentiveness to lived realities—are foundational to the legitimacy and success of co-production processes and sustainability efforts more broadly. When such knowledge is sidelined, we risk developing technically sound but socially brittle solutions, disconnected from the people and communities they are meant to serve.

5. Evidence and affect in environmental decision-making

The hierarchy of knowledge that positions quantitative science as the best source of evidence to inform environmental decision-making can undermine collective action because it does not sufficiently account for lived experiences and the affective impacts of decision-making. For example, in mainstream climate communication, the authority of science is often expressed through data-driven narratives. Johan

Rockström's TED Talk, *The Tipping Points of Climate Change — and Where We Stand*, exemplifies this model-centric paradigm. His presentation draws on global tipping point models to underscore the urgency of climate action, delivering a compelling and rigorous synthesis of accelerating planetary change. The message is clear and authoritative: time is running out, and the world must act decisively and immediately. Science communication is powerful in its ability to mobilize global attention, predict systemic risks, and inform policy design at large scales. While the talk is rooted in scientific modelling evidence, Rockström also invokes his personal expertise and lived experience as a climate scientist to emphasize the gravity of the situation—stating, for instance, that in his professional judgment, we may have only five years left to prevent catastrophic change. These moments of personal reflection add credibility and emotional weight, yet the overall narrative remains anchored in the abstraction of data and systems models.

However, when scientific knowledge is presented in abstraction—removed from the texture of lived experience—it can overwhelm rather than empower. While some may respond to Rockström's message with resolve, others may experience alienation, paralysis, or despair. Data alone, however robust, does not always invite engagement on ethical, emotional and political terms (See Hulme, 2010 for the latter). As a result, scientific knowledge can render climate change legible as a technical problem without making it meaningful as a lived crisis—one that demands not only rational solutions but also moral imagination, empathy, and care.

This gap has sociopolitical implications. When knowledge is implicitly understood as propositional, other forms—particularly those rooted in lived experience—are either marginalized or translated into propositional terms to be rendered legible within scientific discourse. This not only narrows the epistemic scope of co-production but also risks distorting or erasing the very insights that experiential knowledge offers. For example, the marginalization of experiential knowledge can lead to reduced trust and engagement among communities whose lived realities are sidelined. When people feel their voices are not genuinely heard or respected, they may disengage from collaborative processes, undermining the legitimacy and effectiveness of sustainability initiatives. Second, this epistemic narrowing can result in missed opportunities for empathy and innovation in issue formation and problem solving. Experiential knowledge often carries context-specific insights, tacit understandings, and creative problem-solving strategies that are invisible to formal scientific methods but crucial for adaptive and locally grounded solutions. Third, and perhaps most critically, the erasure or misrepresentation of lived experience can cause emotional and psychological harm. Knowledge holders are not abstract entities—they are people whose identities, histories, and emotions are entangled with the knowledge they share. Ignoring this dimension risks violating ethical principles of respect, care, and reciprocity.

To enhance both the legitimacy and relevance of climate knowledge at the science–policy interface, it is essential to engage with experiential knowledge—that is, knowledge grounded in personal experience, affective understanding, and socially situated insight (Haraway, 2013). Storytelling, particularly when rooted in direct experience, can bridge the gap between abstract risk and embodied reality. Victor Ochen's TED Talk, *The Intersection of War and Climate Change* , offers a powerful counterpoint to dominant scientific framings. Drawing from his lived experiences in Uganda, Ochen's stories do not merely describe climate change—they locate it in daily struggles, fractured livelihoods, and morally complex decisions. Through such narratives, Ochen renders climate change not just visible, but morally and emotionally intelligible.

Experiential accounts like Ochen's reveal dimensions of climate risk that often escape model-based approaches: the uneven distribution of vulnerability, the intergenerational stakes of ecological harm, and the ethical weight of adaptation and survival. Markowitz and Shariff (2012) highlight the importance of moral emotions—such as compassion—in catalyzing public engagement with climate policy. Roeser (2012) similarly argues that emotions are not barriers to rational discourse but integral to conveying the moral salience of climate risk. van der Linden, (2015) further demonstrates that firsthand experience with environmental change significantly shapes individual responses and risk perceptions. Taken together, these insights affirm that experiential knowledge—far from being anecdotal or irrational—can complement and enrich scientific understanding, making climate change not only knowable but felt in ways that motivate ethical action.

At the science–policy interface, lived experience shared through storytelling serves not simply to communicate facts but to generate meaning, foster empathy, and cultivate political will. Experiential knowledge—embodied in narratives, testimonies, and affective expressions—adds vital depth to how we conceptualize, understand, relate to and respond to climate change. When legitimized alongside scientific expertise, such knowledge has the potential to broaden the epistemic foundations of environmental decision-making, making space for care, context, and justice in the governance of planetary futures.

6. Narrative and the communication of experiential knowledge

If experiential knowledge is rooted in direct, embodied engagement, its communication presents a particular challenge. Unlike propositional knowledge, it cannot be easily extracted, abstracted, or summarized without compromising its core qualities. This raises a central question for co-production: how can experiential knowledge be understood, shared, captured and accounted for in ways that preserve its affective, sensory, relational and situated character?

The use of storytelling to convey personal experiences offers one compelling response, albeit there are other ways to convey experience such as the Sámi yoik example mentioned above (Aubinet, 2022). As a communicative form, narrative enables individuals to convey not only what happened, but *what it felt like through vivid imagery and emotional cues*. It expresses the temporal, affective, and sensory dimensions of experience that propositional summaries often strip away (Johner, 2025). Philosophers, narratologists, and social scientists have long emphasized the unique capacity of stories to convey subjective experience (Fludernik, 1996; Herman, 2007; Rosenblatt, 1978; Walsh, 1969). This idea is reflected in the notion of *nonpropositional literary cognitivism*, a view found in literary theory and aesthetics which holds that literature can serve as a meaningful source of insight into the qualitative dimensions of human experience (Puolakka, 2022). Rather than simply presenting information, stories[3] draw readers and listeners into the experiential world of others, enabling them to relive events from within rather than observe them from a distance.

This ability of narrative to transmit experiential knowledge rests on several key features. First, narratives unfold in time. As Nussbaum (1990) argues, experiential understanding is inherently temporal: it evolves, resists closure, and is shaped by sequences of events. To communicate such understanding, one must allow for slowness, ambiguity, and complexity. Narrative accommodates these qualities. Unlike scientific argumentation, which often proceeds linearly from premises to conclusions, narrative loops, contradicts, and dwells. It mirrors the recursive, nonlinear flow of human life.

Second, narratives are fundamentally relational. They convey the embeddedness of experience in context, emotion, and relationship. In

[3] As a reviewer of a previous version of this editorial rightly noted, narratives can be employed as tools of deception, manipulation, or propaganda to shape public opinion, discourse, and collective action. We acknowledge that the term *narrative* encompasses such uses by powerful actors and that storytelling extends beyond the sharing of personal experience in co-production contexts. However, the focus of this editorial is specifically on experiential knowledge and how it can be meaningfully accounted for in co-production initiatives. We do not aim to engage with the broader spectrum of narrative practices, including their potentially harmful or strategic deployment for sociopolitical or economic ends.

doing so, they communicate not just facts, but *perspectives*. As Herman (2007) explains, narrative emulates the "what it's like" dimension of consciousness—the interiority and specificity of lived experience. This is not merely metaphorical. Cognitive research increasingly shows that reading narratives activates sensorimotor and emotional pathways in the brain, supporting forms of embodied understanding.

Third, narrative is generative. It invites active interpretation, emotional resonance, and personal engagement. According to Rosenblatt's (1978) transactional theory of the literary work, meaning does not reside solely in the text—it emerges in the encounter between reader and story. In aesthetic reading, the reader engages with the text not to extract information, but to experience it. This contrasts with efferent reading, which focuses on outcomes, arguments, or data. For narratives to serve as vehicles for experiential knowledge, they must be shared and received in ways that encourage aesthetic, rather than merely analytical, engagement.

It is also essential to recognize that Indigenous scholars have long centered story as a mode of knowledge-making, governance, and ethical practice. Storywork, as developed by Archibald (2008), Donald (2012), and Simpson (2014), frames narrative not merely as communication, but as a living, relational process through which knowledge is enacted and responsibilities are shared. These traditions remind us that knowledge is never disembodied, and that storytelling is simultaneously epistemological, ethical, and pedagogical. While this article draws primarily on Western traditions—philosophy, narratology, neuroscience, and environmental science—it resonates deeply with the insights of Indigenous storywork.

Unsurprisingly, therefore, the value of narrative is increasingly recognized across diverse fields. Sustainability scholars have argued that storytelling is not merely a communicative tool, but can help transform perceptions, foster empathy, and catalyze action. Veland et al. (2018), for instance, emphasize the role of narrative in envisioning and realizing 1.5°C futures, showing how stories can help communities imagine alternative pathways and mobilize collective agency. Similarly, Bremer et al. (2017) demonstrate how narrative methods can elicit tacit knowledge of climate variability in Bangladesh, revealing insights that would remain inaccessible through conventional scientific approaches. They argue that these stories, rooted in everyday lived experience, helped bridge the gap between meteorological data and local adaptive strategies. Lejano et al. (2013) further highlight how environmental knowledge is embedded in the narratives of daily life, arguing that understanding climate change requires engaging with the lived realities and relational contexts in which knowledge is formed. These studies underscore that narrative is not ancillary to sustainability science and environmental policy - it is central to how people make sense of environmental change, negotiate uncertainty, and imagine futures. Some narratives, or stories, however, perform better than others, and powerful politicians and companies are also excellent storytellers. The point here is not to use narratives uncritically, or to negate the existence of power, but rather to suggest that they can provide a useful vehicle to surface and communicate marginalized perspectives.

This has important implications for co-production. When stories appear in research merely to support a claim or illustrate a theoretical point—for instance the illustrative examples of Johan Rockström's TED Talk, *The Tipping Points of Climate Change — and Where We Stand* and Victor Ochen's TED Talk, *The Intersection of War and Climate Change*, which we use above, such anecdotes or summary of stories are often read propositionally. In our case, the experiential richness of the two TED Talks are secondary to the logic of our argument since we did not provide sufficient detail and vivid imagery to enable the reader to feel the full force of each TED Talk. To meaningfully integrate experiential knowledge, stories must be treated not as illustrative content of a more general claim, but as knowledge forms in their own right (Johner, 2025). Doing so requires new practices of sharing experiential knowledge, whether it be through writing, singing, dancing, crafting in environmental research—ones that take seriously the epistemic value of embodied and affective dimensions of experience and foster the reader's imaginative, aesthetic, and empathetic engagement.

Human beings are inherently narrative creatures (Gottschall, 2012). Storytelling is a fundamental way we make sense of the complexity and ambiguity of lived experience (Polkinghorne, 1988). When experiences are conveyed through vivid stories, listeners do more than intellectually grasp what someone else has gone through—they *feel* it. Narrative enables us not only to learn about another person's world but to imaginatively and emotionally enter into it. The following section introduces the concept of embodied simulation to explore why it is important to engage with experiential knowledge in ways that create conditions for shared experience. Such engagement can foster the development of empathy and *response-ability*, particularly when co-production processes are intentionally designed to cultivate these relational and affective capacities.

7. Embodied simulation and the neuroscience of narrative

The ability of narrative to convey experiential knowledge is increasingly supported by insights from cognitive neuroscience. In particular, the theory of embodied simulation, developed by neuroscientist Vittorio Gallese and others, provides a compelling account of how readers come to understand and "feel" the experiences of others through narrative (Gallese, 2005; Gallese and Wojciehowski, 2011; Gallese, 2017).

At the heart of this theory is the role of mirror neurons—neurons that fire not only when we perform an action, but also when we observe someone else performing it (Gallese and Wojciehowsi, 2011). These neural mechanisms enable us to simulate the actions, intentions, and emotions of others in our own bodies. Gallese (2011) describes this as a "pre-rational, non-introspective process" that generates a physical and affective experience of another's mental and emotional states. It is not a matter of conceptual inference, but of bodily resonance. We reuse our own past embodied experiences to understand those of others, even in the absence of direct interaction. Yet this same mechanism can also lead us to reject or dismiss unfamiliar experiences when they conflict with our own embodied histories or emotional frameworks. In the context of co-production, such dissonance can undermine mutual understanding, reinforce epistemic boundaries, and stall transformative collaboration.

Importantly, this process is not limited to real-life observation. Embodied simulation is also activated when we imagine events, such as during the reading of a narrative. As Gallese (2011) argues, the brain's simulation mechanisms are "liberated" in narrative engagement—freed from the constraints of actual movement and able to project us into imagined scenarios. When we read about a character walking through a dense forest, for example, our sensorimotor systems respond as though we were there: we feel the unevenness of the trail beneath our feet, hear the snap of twigs underfoot, sense the dampness of mossy air, and adjust our stride to avoid low-hanging branches. This simulation is not merely metaphorical—it is physiological, grounded in the activation of neural circuits shaped by our own embodied experience of moving through the world.

Gallese (2011) refers to this as liberated embodied simulation—a process by which narrative engagement allows us to inhabit experiences beyond our own, generating empathy and understanding. It is through this mechanism that narrative becomes a vehicle for experiential knowledge. The reader does not merely comprehend what happened; they live through it, albeit in a simulated form. This supports the idea that narrative knowledge is not reducible to information transfer. It is an immersive, affective, and bodily experience.

This has clear implications for co-production. If experiential knowledge is to be communicated and shared across epistemic communities, it must be done in ways that activate these embodied simulation mechanisms. Narrative offers one such mode. But for this to be effective, narratives must be presented to support immersive engagement. They must be detailed, situated, and affectively rich. Scientific

writing conventions, which favor abstraction, generalization, and emotional restraint, often work against this goal. To fully integrate experiential knowledge into co-production, then, requires not only including narratives, but attending to how they are constructed and how they are read.

8. Recommendations to surface and account for experiential knowledge in coproduction

If experiential knowledge is to be meaningfully accounted for in co-production, it cannot simply be included—it must be legitimized and expressed on its own terms. This requires shifts not only in methods but in epistemological commitments and relational practices. Below, we offer seven practical recommendations for researchers and practitioners seeking to engage with experiential knowledge in non-reductive, non-extractive ways. Fig. 1

1. Make space—for stories and the relationships that sustain them.

   Experiential knowledge emerges slowly, through trust, time, and meaningful relationships—when the pace of conversation allows for reflection, and when participants feel genuinely heard and respected (Cvitanovic et al., 2021). It often surfaces during unstructured, embodied encounters: walking together, sharing meals, or lingering in informal conversations. Creating space for such stories requires rethinking research timelines and methods—valuing relational practices that fall outside conventional protocols (Klenk, 2018). It also means making room in research outputs for stories to be shared in their full rhythm, not just as decontextualized quotes.

   Practically, this calls for methodological patience, flexible timelines, and ethical attentiveness. Not all stories told in co-production are meant to be shared widely. Relational accountability and reciprocity must guide every stage of the process, from initial engagement to final outputs.
2. **Let stories speak—before interpreting them.**

   In co-production processes, when experiential stories are shared, resist the urge to analyze them too quickly. Instead, consider what aspects of the experience should be conveyed: the emotional tone, the ambiguity, the context, the social dynamics. Focus on *how* to communicate these elements in writing—so that readers can feel and dwell in the story, not just extract meaning from it. Interpretation has its place, but it should not come too early or be treated as final. Give stories room to resonate on their own terms—allowing for complexity, contradiction, and emotional nuance. Practically, this means incorporating storytelling into research outputs in ways that foreground lived experience first, perhaps by opening with unframed narratives, using creative formats, or collaborating with artists and storytellers to preserve the affective power of the account. This is our intent with the opening of our editorial with two rhetorical questions and a short story.
3. **Welcome multiplicity, including contradiction.**

   One of narrative's greatest strengths is its capacity to hold multiple, even conflicting, experiences. Unlike propositional knowledge, which often seeks coherence and resolution, experiential knowledge reflects the tensions, ambiguities, and paradoxes of lived experience. In co-production, this means resisting the urge to reconcile all perspectives into a single, unified account. Instead, researchers and practitioners should make space for diverse voices to coexist—without collapsing difference into consensus.

   Practically, this can be done by presenting multiple narratives side by side, highlighting their specific contexts, values, and emotions. This might involve curating story clusters or thematic groupings that allow patterns and divergences to emerge organically. Reflexive commentary written by different co-production participants within a single output can be used to surface the tensions between perspectives, without resolving them. When developing outputs (e.g. reports, articles, or presentations) minority reporting can be used to acknowledge divergence in perspectives. Ultimately, making space for contradictory narratives is both a methodological and ethical commitment—one that recognizes the complexity of lived experience and the political importance of preserving difference in co-production.
4. Receive and present narratives in ways that respect diverse aesthetics.

   To support the sharing of experiential knowledge, researchers and practitioners must engage with stories in ways that honour their affective, embodied, and relational dimensions, in other words, their aesthetics. Yet, what counts as "aesthetic" varies greatly across cultures, communities, and individuals. Storytelling styles—including tone, pacing, structure, and emotional expression—are shaped by lived experience, language, and social context. This variation raises a critical ethical question: whose narrative sensibilities are being centered, and whose might be overlooked?

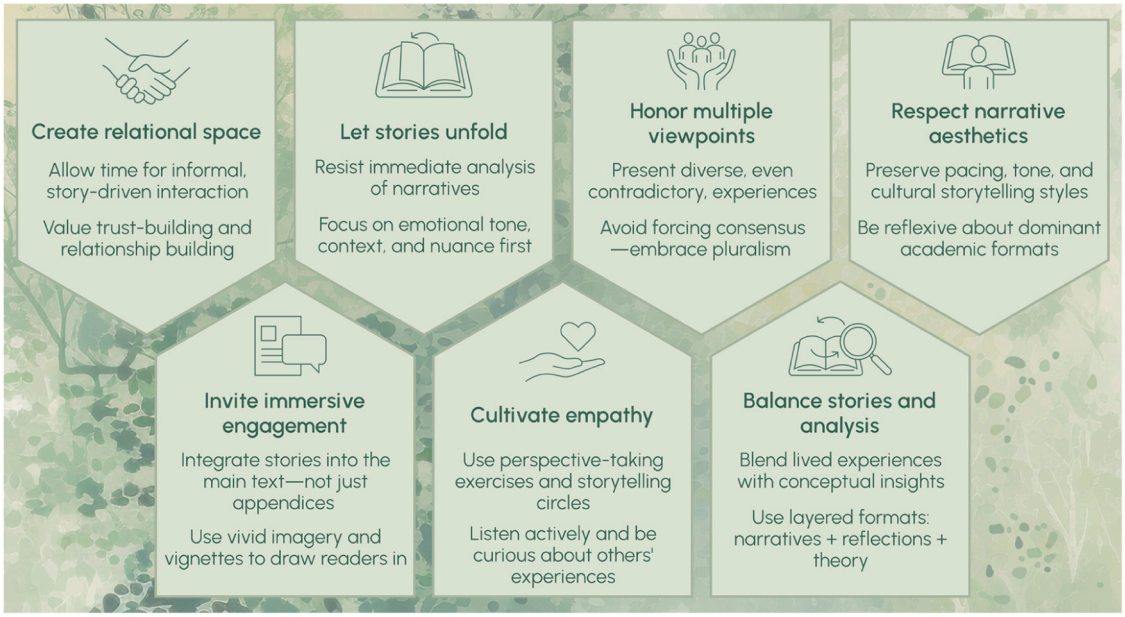

Fig. 1. Recommendations for surfacing experiential knowledge in co-production. Graphic design by Stacey McCormack, 2025.

Rather than prescribing a particular narrative form, co-production participants should be cultivate listening and be curious about different modes of expression, even if they might at first seem unfamiliar or opaque. In written outputs, this means resisting the urge to flatten stories into uniform formats (e.g., boxed case studies or illustrative quotes) and instead working to preserve their rhythm, complexity, and emotional texture.

Practically, this calls for reflexivity about the dominant aesthetics within one's discipline and audience, and a commitment to accommodating—rather than assimilating—diverse ways of knowing and expressing. Experiential knowledge does not come pre-packaged in neat story arcs. To truly support its transmission, co-production participants must attune themselves not only to what is said, but to how it is said—and be willing to let stories reshape the contours of scholarly communication.

5. **Present narratives in ways that invite aesthetic reading.**

To support the transmission of experiential knowledge, stories must be shared in formats that encourage immersive and emotional engagement. Aesthetic reading, as theorized by Rosenblatt (1978), foregrounds the reader's affective and imaginative involvement in the experience of the text. Yet in academic work, stories are often relegated to appendices or reduced to short case study boxes, where they are framed primarily for information extraction. Instead, narratives should be integrated into the main body of research outputs and presented in ways that guide the reader toward an aesthetic encounter with the story. This might involve narrative vignettes, first-person accounts, or curated story cycles that invite reflective engagement. Such techniques enable stories to function as knowledge—not just as examples of it.

6. **Recognize empathy as central to co-production.**

When readers engage empathetically with a story, they come to understand not only what happened, but what it meant to the person who lived it. This aesthetic and affective engagement nurtures empathy, a critical faculty for co-production. Empathy enables co-production participants to discern what matters to whom, and why. It also helps illuminate what Nussbaum (1990) calls tragic situations—policy dilemmas in which all available options involve some form of harm. In such contexts, propositional reasoning alone cannot guide action. What is needed is a deeper, more embodied understanding of the stakes as they are lived, felt, and interpreted by those directly affected. Empathy is also essential to grasp the motivations behind action or inaction, particularly in situations of uncertainty, tension, or conflict.

Where appropriate, use empathy-building activities in workshops, such as storytelling circles, fictionalized dilemmas, or structured perspective-taking exercises. Model emotional reflexivity by acknowledging your own reactions to stories, especially when they evoke discomfort or ethical tension. Importantly, this work must also be grounded in an awareness of positionality, power dynamics, and underlying value systems—recognizing that how stories are heard, interpreted, and acted upon is shaped by who is listening, from where, and with what assumptions. Finally, resist the impulse to resolve or simplify complex narratives; allowing stories to remain open-ended can deepen understanding and support more empathetic and context-sensitive decision-making.

7. **Treat experiential and propositional knowledge as complementary.**

While this editorial has emphasized the distinctions between experiential and propositional knowledge, the two are complementary. Facts, theories, and arguments can help interpret, frame, and communicate experiential insights—particularly in interdisciplinary settings (Johner, 2025). However, the interpretation of experiential stories in co-production processes must begin from a position of respect for their distinct nature and value, not assimilation into generalizable claims about experience.

In practice, this means allowing experiential insights to influence every stage of the research process: shaping research questions, informing methodological choices, and challenging disciplinary assumptions. Outputs can combine narrative and analytical elements—for instance, pairing first-person accounts with critical reflection, or integrating story cycles alongside conceptual discussion. Collaborative writing with experiential knowers can help ensure their insights are not only included but also shape the framing and interpretation. When presenting findings, consider formats that respect multiple epistemologies, such as layered storytelling, dialogic reports, or multimedia outputs that blend text, sound, and image. These practices signal a commitment to epistemic equity, making it possible for experiential knowledge to transform how we understand and represent the world.

8. **Acknowledge the emotional and embodied dimensions of co-production.**

As Lemos and Klenk (2020) argue, co-production is not only a method but a relational and emotional practice. Researchers, policymakers, and community participants alike bring their own vulnerabilities, hopes, and anxieties into the process. These emotional experiences are often invisible but deeply influential. Co-producing actionable knowledge requires affective labor—navigating uncertain evidence, institutional pressures, and the expectations of affected communities. This emotional exposure can generate feelings of precarity that shape how people relate to each other and to the knowledge being produced.

Recognizing the emotional and embodied aspects of co-production expands its normative dimensions. It invites us to foster trust, care, and reflexivity not only with participants but also within research teams and institutional settings. Attending to these affective dimensions is especially crucial when engaging with experiential knowledge, which is often shared with vulnerability and with a hope of being heard.

9. Conclusion

Co-production is widely recognized as a promising framework for producing knowledge that is inclusive, actionable, and socially relevant. Yet despite growing attention to epistemic diversity, experiential knowledge remains marginal in both theory and practice. It is often acknowledged rhetorically but rarely engaged on its own terms. Instead, it is translated, abstracted, or subordinated to propositional forms—flattening the complexity and richness of lived experience.

These seven recommendations are not exhaustive, nor are they prescriptive. Rather, they offer starting points for reimagining how experiential knowledge might be ethically and meaningfully accounted for in co-production. They emphasize that such inclusion requires more than methodological tools—it demands changes in how we listen, relate, and respond. At their core is a simple but transformative insight: that experiential stories are not merely sources of data or illustrations of theory, but forms of knowledge in themselves. To co-produce meaningfully, we must learn to make space for stories to emerge, to receive them with care, and to allow them to reshape our research practices. This calls for deep listening, methodological patience, and an openness to be affected. Without this, co-production risks reproducing the very exclusions it seeks to undo.

This editorial has argued that if co-production is to fulfill its transformative promise, it must take experiential knowledge seriously—not just as context or illustration, but as a legitimate and valuable way of knowing. Drawing on insights from philosophy, narratology, and neuroscience, we have shown how narratives enable the sharing of experiential knowledge in ways that propositional language cannot. Through aesthetic engagement and embodied simulation, readers can come to relive the experiences of others, generating forms of understanding that are affective, situated, and relational.

This has profound implications for how we conduct research at the environmental science-policy interface, how we write and present our findings, and how we think about the role of knowledge in social change.

It requires a shift in both method and mindset—a move away from extractive practices and toward a co-production that listens, lingers, and learns from the richness of lived experience. It also challenges us to rethink academic conventions: to create space for story, for slowness, and for multiple voices to speak—even when they do not align.

In doing so, we move closer to a model of co-production that is not only participatory in form, but pluralistic in content. A model that recognizes that knowledge does not reside only in facts and figures, but also in footsteps, gestures, and voices. That sees a story not just as a supplement to science, but as a way of knowing the world—and a way of changing it.

Declaration of Generative AI and AI-assisted technologies in the writing process

The corresponding author used ChatGPT 4.0 on the final version of this editorial to improve readability. After using this tool/service, the corresponding author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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