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Virtanen, Pirjo Kristiina

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Introduction: toward more inclusive definitions of sustainability☆

Pirjo Kristiina Virtanen[1,2], Laura Siragusa[1,2] and Hanna Guttorm[1,2]

This article identifies core dimensions in the notion of "sustainability" as it is conceptualized among Indigenous peoples. These are context-based relationality, community-based governance, education, language, quality of life and health, and communal recognition of certain nonhumans as life-givers. Taking into account different Indigenous cultural and socio-philosophical experiences and their process of sociality with different life forms, it has become clear that these are little spelt out in the previous sustainability definitions. Thus, understanding how local interconnections are sustained and reproduced, both for humans and nonhumans, should inform policy mechanisms as well as new forms of evidence. We want to point out that the UN Sustainable Development Goals (SDGs) cannot and should not be taken as universal due to conceptual and moral differences among different communities and peoples.

Addresses
[1] Indigenous Studies, Faculty of Arts and Humanities, University of Helsinki, Finland
[2] Helsinki Institute of Sustainability Science (HELSUS), University of Helsinki, Finland

Corresponding author: Virtanen, Pirjo Kristiina (pirjo.virtanen@helsinki.fi)

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This review comes from a themed issue on **Indigenous conceptualizations of 'sustainability'**

Edited by **Pirjo Kristiina Virtanen**, **Laura Siragusa** and **Hanna Guttorm**

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Indigenous peoples live on all the world's human populated continents, and their contemporary territories encompass a substantial proportion of the planet's surface [1•]. These include lands that are demarcated by the states, as well as areas that are not officially recognized. Yet, they represent a much smaller fraction of the territory they used to occupy, as some groups have been constrained to limited areas and others have been forced to leave their ancestral lands. Well-established evidence shows that a very rich linguistic, cultural, and biological diversity is situated in theareas, where Indigenous peoples live today. This makes it an imperative to look at Indigenous ideas, notions, and conceptualizations of how sustainability is (or, in some cases, used to be) experienced, imagined, and practiced. In academia, Indigenous knowledge, practices, languages, and philosophies still need more inclusiveness.

Previous studies have explored methods in approaching sustainability in Indigenous communities, such as collaboration and collective data mapping [e.g. Ref. 2•], as well as the contributions of Indigenous knowledge and values to sustainability [e.g. Refs. 3,4••,5,6•]; however, in these pioneering works, the conceptualization of such a notion among Indigenous groups has been overlooked. Given that Indigeneity is a category of international legal instruments, our work also intends to inform policy-making processes for further inclusiveness of Indigenous practices and knowledge. While it is important to understand that to a certain extent some Indigenous practices and epistemologies match more dominant ones, given a long-history of contact and exchange, we should also appreciate how these are a product of global and local historical and political developments that have distinguished themselves from the mainstream.

In this introductory article, we have identified a few core dimensions in the notion of 'sustainability' as it is conceptualized among Indigenous peoples. These are context-based relationality, community-based governance, education, language, quality of life and health, and communal recognition of certain nonhumans as life-givers. We demonstrate that earlier definitions of this notion give little space for the inclusion of sustainability as defined and lived among Indigenous peoples. The Brundtland Commission initially provided the notion of 'sustainable development' with its three intersecting and ranked hierarchically pillars (social, economic, environmental) [7], without making any distinction between actions and their results. Later several other definitions of sustainability have drawn from it such as people, planet, and profit model by Elkington [8]. Leach *et al.* [9] have pointed out that these models consider 'sustainability' as an aimed goal, an end product in opposition to 'sustainable development', which they describe as the social-ecological process to reach such a goal. With this

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article, we spell out the different cultural and socio-philosophical experiences that are included in the process of sociality (for example, with nonhuman actors), and indicate how economy cannot be separated from what has been referred to as 'the environment'. We also want to point out that the UN Sustainable Development Goals (SDGs) cannot and should not be taken as universal due to conceptual and moral differences among different communities and peoples. What is paradoxical is that the injustices SDGs aim to tackle, are not necessarily spelled in similar terms by Indigenous peoples.

Contextuality and relationality

Several Indigenous communities use terms similar to 'sustainability', which they describe as healthy living, taking into consideration skills, reflexivity, competences, emotional, spiritual, economic, and social well-being in order to foster and respect co-existence [10–13]. Sustainability can be seen as the capacity of a certain community to create and maintain communal existence through the management of the local natural resources in a way that assures the survival and interconnectedness of the members of both the community and the environment [14••]. On the one hand, Indigenous peoples cannot generally be said to be conservationists; on the other hand, it could also be argued that their negative impact on the environment has in most cases remained less than in other cases. Even if this can be said to be a result of lack of production technologies or access to markets, the IPBES global assessment has shown that biodiversity has not declined in different Indigenous communities as it has in other areas [1•].

One of the characteristics for Indigenous theories of constructing sustainability and communal well-being is that they draw from contextualizing one's healthy relations with other humans and other-than-human beings (understood as nonhuman beings, such as plants, animals, and many other lifeforms regarded in animist conceptualizations), rather than considering them as independent entities. Furthermore, these relations depend on the particular and thus varying geographical, historical, and temporal circumstances that Indigenous peoples relate to. Their knowledge production of what constitutes sustainability is produced contextually, locally, and is based on the experiences of multiple generations [15••,16–19,20••,21].

Indigenous theories and notions of sustainability often challenge dominant, so-called 'Western' ideas of personhood, agency, and ownership [see also Fernández-Llamazares & Virtanen, Vásquez-Fernández & Ahenakew, this issue], and point to ways human beings exist in complex and constantly changing human-environment collectives. Thus, even if these ideas would at first glance seem to fit into what sustainability transformations theories would call place-based, sustainable pathways, and approaches that take into account differing social and economic contexts [22,23], the core ideas of Indigenous theories of being, knowing, and their values rarely inform sustainability theories in science. Therefore, their integration into sustainability science in particular is increasingly significant both in academic and in political circles.

Sustainable community-based governance

In order to integrate Indigenous points of view and knowledge in sustainability discussion, Indigenous governance, self-determination, and sovereignty should be taken into consideration. Indigenous governments, leadership structures, and customary law include relationships and relationality with the environment, and are crucial for place-based sustainability [24]. These include traditional organizations and knowledge of how to manage land-related, water-related, fire-related, and wind-related practices and resources that can be traced to the time before the colonial period [e.g. Refs. 25,14••,26]. Furthermore, among some Indigenous peoples, kinship relations and governances are often integrated into developing new economic activities and Indigenous entrepreneurships, as the studies from North and Latin America, and Aotearoa show [e.g. Refs. 27–31], and land management and conservation efforts also indicate [e.g. Refs. 32,33]. Because of long-term interaction relations and ideas of ancestry, certain animals and plants are understood to exist in processual kinship relations to people in several Indigenous communities [34–37].

Indigenous regulatory governance and customary legal structures deal with human-environment interactions, not only human-to-human relations. They are thus also an issue of international human rights law [24], and issues related to climate change. The state laws play then a key role in involving non-state political authorities in order to create more inclusive sustainability policies and are paramount for better regulations [24, 38]. Inclusive practices, combining different knowledges, and interaction between governmental and Indigenous organizations have shown good results in territorial protection, conservation, [e.g. Refs. 33,39,40], and developing health and schooling services for Indigenous populations.

Educating for the future through reflection on relations

Indigenous peoples' knowledge and ways of knowing-based on the observation of various generations and an appreciation of the interrelatedness of humans and the other-than-human beings have often materialized and been reproduced in practices, language, communication, movements, art, and has consisted of various visible and invisible aspects as well as material and immaterial dimensions. Even if such knowledge is still often considered 'illegitimate' or marginal in the dominant Euro-American science [41], where possible, Indigenous communities continue to teach long-term refined forms of

Indigenous science to younger ones, who in turn dynamically introduce innovations and change to the knowledge of earlier generations [e.g. Ref. 42]. Learning individuals' connections to other beings is at the core of Indigenous teachings for sustainability, in which morality, ethical guidelines, and namely ethics of responsibility play a key role [15••,43,44]. Several governmental and nongovernmental agencies as well as researchers work for the inclusiveness of Indigenous knowledge.

Since the years of assimilation, several educational institutions, where practical knowledge of Indigenous communities is (re)learned and strengthened, have been established. Digital technologies can also sustain and advance these communities. Even if Indigenous knowledge is regenerated by younger generations, these ideas are still too rarely listened to by outsiders or taken into account when economic projects take place in the proximity or inside Indigenous lands [45,46]. Yet, even if there is strong evidence of long-term Indigenous ways to manage the land, to domesticate, and to contribute in diverse ways to biocultural diversity [e.g. Refs. 1•, 47; on Amazonian precolonial time see e.g. Ref. 48], several Indigenous communities still experience suppression and discrimination where their environmental knowledge is concerned. Indigenous ideas can also inform environment-management more largely, which might, for example, help intervene in such situations as the recent environmental forest fires in Australia. It could be argued, indeed, that this was a serious climate change issue, and it substantially arose from lasting suppression of Indigenous knowledge and practices.

Quality of life alternatively measured

When sustainability is assessed, knowledge that is relevant to a place is of more value than universal knowledge. This is connected to the notion of resilience and might not only foster local capacity-building, but also implement projects of co-design and collaboration where a synthesis across multiple knowledge systems is aimed at [e.g. Refs. 49,50]. Overall, collaboration and cooperation are the keys to weave Indigenous methodologies into diverse projects [2•]. This means simultaneously identifying methods to maintain the variety and richness of local knowledge in order to counter reductionist approaches in politics and decision-making [51].

As it is not easy to detach knowledge from the environment in which it is produced and to what it is connected, Indigenous knowledge should be regarded as a process, where communities become "empowered through self-confidence, derived from their own knowledge, to inform development interventions which directly affect them in their everyday lives" [52, 240]. Kealiikanakaoleohaililani & Giardina [14:61] state that, "Western sustainability science remains a surprisingly poorly defined identity as exemplified by ongoing debates about the motivations and drivers of resources management," and that is why an engaged and open discussion is still relevant. Nevertheless, there are diverse alternative paradigms and designs, such as the ideas 'degrowth', 'permaculture', and 'slow movement', which have originate to various places in different forms in different continents. These new practices are introduced in order to pursue an ecologically and socially more just world collectively, and they allow measuring and crafting the quality of life differently. The involvement of these diverse paths towards integrative and inclusive practices, as well as linking ancestral and contemporary knowledges have been called synthetically pluriverse, a world of many worlds [53,54].

Sustaining relations through language

Communication — either in verbal or non-verbal forms — stands at the core of the dynamic relations that Indigenous peoples have had with human and non-human beings, a more-comprehensive social, language, and political ecologies, and the consequent emerging ideologies [cf. Ferguson and Weaselby, this issue). Ways of speaking (and sometimes writing, too) among Indigenous groups have responded to these changes dynamically, often relying on long-term communicative practices with other-than-human persons and the environment more broadly. Such ways of speaking have comprised narratives, stories, genres, and non-verbal communication expressed and manifested in bodily exchanges with the environment as well as the forming of cultural landscapes [12,55].

To think of the notion of 'sustainability' when (Indigenous and non-Indigenous) scholars present language both in its oral and written modes among Indigenous groups, is thus a commitment to think of all the relations—old and new—that these relations have comprised. Sustaining Indigenous languages involves maintaining and promoting new and old communicative practices, instead of perceiving them as in opposition. Revitalizing Indigenous languages often means establishing a standard language that needs to be codified and consequently promoted in various platforms (be these educational institutions or publishing houses). Revival programs also require the assistance of more fluent speakers (often the elderly) and the need to foster intergenerational language use. Some language projects have thus applied the Master-Apprentice models, an immersion model where elderly and young people engage closely for the purpose of maintaining the language. Thanks to language technology and standardization projects as well as the rediscovery of archival language documentation materials, more and more Indigenous languages mark their presence in online platforms [cf. 56], for example, which shows new, creative ways of promoting their often 'endangered' heritage language. The success of those programs often depend on the social and political ecology in which they are immerged.

While such revival efforts and initiative might be perceived as a good indication of language 'vitality', we should also point out that Indigenous ways of speaking have often emerged in relation to non-urban ways of living and environments, in constant dialogue with other-than-human persons. To be forced to move away from a territory where one has long lived, or to see it exploited and damaged often for the benefit of others, means the disruption of long-standing relations with other-than-human beings that made communication possible in the first place. Therefore, when considering issues of 'sustainability' and language practices, it is paramount to think of the multiple relations comprised in language practices, whether these have recently emerged or have a long-standing history [cf. 57].

Sustaining health and healthy relations

When addressing issues of 'sustainability', notions of health and health practices also need to be addressed, as they affect sociality and relationality with the human and nonhuman dimensions of life. Once again, appreciating a plurality of approaches concerning health can help us add to the multifaceted notion of 'sustainability' we want to introduce in this issue. Understanding health and how it is conceptualized among Indigenous peoples already challenges predominant approaches, as it often tends to be understood in relation to the well-being of the communities, non-human persons, traditional practices, and empowerment. Within a broad Indigenous perspective, health tends to be understood as relational, mutual, and often located [cf. 58,59].

Thus, it is no surprise that Indigenous peoples have engaged in health practices both by employing verbal and other communicative practices with nonhumans and by relying on a deep knowledge of the herbal landscape available in their territories [60–62] to name a few recent studies. Ethnomedicine is a field of study that has long investigated how local and Indigenous peoples have made use of herbs, plants, and animal parts for curative and healing purposes. From this field of study, a rich knowledge has surfaced that is regularly grounded on long-term relations with the environment and its non-human inhabitants.

These long-standing practices have gone hand in hand with so-called 'Western' medical practices, even though they are often perceived to be in opposition. Indeed, these 'traditional' healing measures have sometimes been incorporated into more dominant and recent ones. They are also still actively employed, often in the more rural, isolated territories where Indigenous people tend to live. Yet, these distant territories have serious problems in receiving the national health care services that they need and that the law should guarantee them. Admittedly, other services, comprising educational ones get often cut off of those more remote territories.

To sustain these practices means not opposing 'traditional' with new emergent ways of healing, but rather appreciating the domains that each of the tradition covers and relying on their individual strengths. To sustain practices that benefit the well-being of both humans and non-humans also means engaging in practices of care, responsibility, and respect for the environment, land, and territory where landscapes are perceived as sources of medicinal plants. It means preserving the biodiversity available in these territories. It means letting Indigenous peoples continue to engage in values, methods, and exercises that allow this biodiversity to flourish [see also Löw, this issue, concerning gender and relations to the forest].

Pointing to the life-givers — 'sacred' aspects highlighted

Deep-rooted relations with place and with resources encompass multiple ways to interrelate and connect with all beings, such as plants and non-human animals. This understanding draws from the idea that humans also depend on spiritual and non-human actors' agencies. Indigenous care towards the land, the environment, and other-than-human beings is often founded on respectful and sacred relations as well as shared responsibilities [e.g. Ref. 14••,63,64]. Sacredness and sacred actions, commitments and sentiments "emerge from spirit-based relationships that are founded on love, respect, care, intimate familiarity, and reciprocal exchange" [14: 57]. The most crucial connections are also visible in the language used, such as blessing and verbal charms. Indigenous approaches to sustainability and development emphasize place and locality, relationships and sacred exchanges, where the quality of life is measured and adjusted to meet the needs of the human-non-human community and future generations.

Living the future

Comprehension of how local interconnections are sustained and reproduced, both for humans and nonhumans, require informed policy mechanisms as well as new forms of evidence. Different dimensions of Indigenous ideas of sustainability as well as processes leading to it show how context-based relational thinking bridges humans and nonhumans, community-based governance, education, language, and quality of life and health. Furthermore, the communal recognition of certain nonhumans as life-givers points to a specific view on sustainability, which goes beyond a future-orientated idea of sustainability or sustainable development.

In some sense, the universalistic definition of sustainability within SDGs can hinders other views on sustainability, which differs from it. The design of theUN Sustainable Development Goals has made a significant contribution to implementing and reflecting on new actions and practices through its 17 dimensions of sustainability, but they

are still largely drawn from individualistic, conventional human-based approaches, providing for instance only one idea of what ‘economy’ means and how schooling and technical development advances sustainable development. Alternative strategies and different views on sustainability are urgently needed in the current climate emergency.

Overall, this special issue shows multidimensional elements involved in Indigenous conceptualizations and argue that there is no single or universal definition of ‘sustainability’. Despite the concept being defined in the intersections of economic, social, and environmental dimensions of life, we call for a critical approach to understanding how sustainability is lived locally and in different social orders. For instance, several Indigenous notions of sustainability cherish the idea that the land is much more than an object to guarantee economic growth.

Conflict of interest statement

Nothing declared.

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