

Policy Brief 1: Measuring Biocultural Diversity

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BIOCULTURAL INDICATORS AND THE NEXUS OF NATURE, CULTURE, AND WELL-BEING

In May 2019, more than 120 participants - Indigenous Peoples from Canada, the United States of America, Aotearoa New Zealand, and Australia, together with partners and supporters - came together at a Regional Indigenous Research Action Conference and at the first North American Dialogue on Biocultural Diversity to advance joint strategies to promote the diversity of life on earth. This series of policy briefs draws on the discussions held at these meetings and draws from the recommendations of the Atateken Declaration,¹ adopted by the participants of the Dialogue.

Introduction

In 1988, Indigenous Peoples, Local Communities, scientists, and environmentalists from across the globe came together in Belem, Brazil, for the first International Congress of Ethnobiology. The main output of this Congress was the Declaration of Belem.² This declaration is one of the first global policy documents to address the “inextricable link” between nature and culture. Since then, cross-mapping of linguistic, cultural, and biological diversity has shown substantial geographic overlap among these. Biocultural diversity is the combination of biological, cultural, and linguistic diversity, which comprises the species, cultures, and languages that have evolved on our planet.³ These diversities are embedded within complex networks of place-based interactions and inform the ways people adapt practice over time to enhance local and global sustainability.⁴

The co-evolution of humans and nature creates complex and reciprocal social and ecological feedback.⁵ Governance and management maintain these feedback over time and, when responding to change, adjust and transform them.⁶ Knowledge of how, when, and why to employ specific resource management strategies is locally nuanced. Accordingly, plans and strategies should address the unique social, cultural, economic, and environmental contexts of various communities.⁷ One important source of this knowledge comes from Indigenous Peoples, who possess significant experience developing strategies and actions to govern the sustainable use and conservation of resources in unique

Key points

- The conventional separation of biological and cultural diversity in worldviews and in conservation and sustainable development decision-making can reinforce divergent and conflicting agendas and inhibit the reconciliation of competing interests.
- Actions and strategies that acknowledge the connections between nature, culture, and well-being should be strengthened and supported by local, regional, and national political authorities as well as research institutes and universities.
- Biocultural indicators can integrate biological and cultural diversity through the lens of relationships between human and other-than-human life.
- Biocultural indicators of well-being should be rooted in place-based cultural perspectives, values, and knowledge systems. They should be both context-specific and given voice in global arenas.

biocultural landscapes and important biodiversity hotspots around the world.^{8,9} Many Indigenous-based approaches feature holistic concepts of well-being that acknowledge interconnected social, cultural, and ecological dimensions. This lens, used in combination with a biocultural approach to locally-defined measures of well-being, results in indicators that are directly tied to territory and grounded in the places, cultural practices, and knowledge of self-governing local peoples.¹⁰

Efforts to support and enhance the full and effective participation of Indigenous Peoples and the equitable inclusion of Indigenous Knowledge (IK) in resource management have revealed important gaps in the environmental monitoring and reporting metrics currently used by state-centric managers. For example, one analysis from Canada noted that national and international forest management frameworks focus primarily on ecological processes and may omit locally meaningful factors essential for decision-making such as community well-being, historically embedded cultures, and customary governance systems.¹¹ While many nation-

al and international sustainability goals and commitments focus on indicators of biodiversity to inform on-the-ground sustainability, biological diversity, resilience, and conservation actions, this can be problematic given the strong links between nature, culture, and multidimensional well-being. Fully exploring and realizing these links for conservation and sustainability planning requires locally-attuned approaches based on Indigenous cosmologies, worldviews, values, and priorities.¹² This includes creating indicators that reflect Indigenous visions for healthy socio-ecological systems.¹³ Ultimately, acknowledging and fostering interdependent biological and cultural dimensions of environmental stewardship can support dialogue and exchange in natural resource management toward meaningful collaboration for future solutions.

Main challenges

Differing conceptions of health, well-being, and territory

Indigenous and non-Indigenous knowledge systems may define health and well-being on quite different scales (i.e. geographic, social, cultural, etc.). For example, definitions of well-being focused on individual benefits may contrast with Indigenous holistic definitions of well-being as pertaining to whole communities of life or collective wellness.¹⁴ While Indigenous worldviews describe human and other-than-human well-being as extensions of one other, other ontologies differentiate between human and ecological health.¹⁵ Most ecosystem health indicators to assess conservation efficacy in state-governed protected areas currently focus on quantitatively assessing ecological states, trends, and functions.⁷ In contrast, Indigenous-defined measures of success in ecosystem management center on maintaining healthy relationships between humans and other-than-humans through respectful interactions, including sustainable use when appropriate. Neglecting these differences in indicators of ecological and human well-being can undermine national and international conservation goals, while contravening the rights of both peoples and nature.

Indigenous practices of stewardship and guardianship may substantially differ from prominent global resource management strategies. For example, conservation policies across decision-making scales often separate land and sea areas through jurisdictional divides, whereas Indigenous knowledge systems support holistic resource management by acknowledging habitat continuity and interconnections between human and other-than-human relations across terrestrial, freshwater, and marine spaces. For example, Henry Huntington, an arctic researcher, recorded the IK of Inuit

hunters in Alaska about the population dynamics of beluga whales. Inuit Elders informed him that there is a connection between an increase in beaver populations and a decrease in beluga populations. More beavers translates into less habitat for spawning fish, which, in turn, negatively affects food resources for beluga whales.¹⁶ Hence, biocultural indicators rooted in places and networks of places are superior measures and guides to conservation practice. While there are growing efforts to acknowledge other effective conservation measures in global conservation policy and action, for instance those of Indigenous Peoples, this remains an area where additional efforts are necessary.¹⁷



Alaska landscape. Photo by Rod Long.

(Mis)appropriating and using Indigenous Knowledge

Indigenous Peoples have historically shared their observations, traditional teachings, and insights with those open to hearing and listening. However, access to and use of this knowledge comes with inherent responsibilities. Groups who work with Indigenous Peoples, or those who conduct research on traditional territories, should recognize the right of Indigenous Peoples to grant free, prior, and informed consent. Interested groups should obtain consent within appropriate institutional and local community pathways before initiating any project.¹⁸ For instance, the Mi'kmaw people of Canada have established a set of principles and guidelines to regulate access to and use of Mi'kmaw knowledge, including the need for research to be reviewed by Mi'kmaw Ethics Watch, and for research to be understood as a “negotiated partnership”.¹⁹ Researchers and groups who work with Indigenous Peoples should consider the role of knowledge co-production and project co-development together with the host community.

Despite the rise in legitimacy of IK in academic and policy circles, some major issues, such as dualistic tensions between Indigenous knowledge systems and Western science, romanticization, decontextualization, asymmetrical power

relations, and fears of misappropriation continue to inhibit the role of IK in development planning and implementation. These issues also complicate dialogue between Indigenous perspectives and predominant approaches to environmental governance. For instance, the ecosystem services (ES) framework is an increasingly popular way to describe natural systems in relation to human needs. ES are a conservation science tool used to characterize the diverse suite of values provided by the environment. One aspect of the ES approach is the ability to attribute monetary value to changes to ecosystem services and their impacts on human well-being. Since the early 1970s, monetary valuations of common pool resources (i.e. clean air and water) has been one way to increase public interest in conservation by demonstrating well-being in economic terms.

While there are both challenges and opportunities surrounding the theoretical and practical application of monetary valuations, there remain key concerns regarding the ideology and assumptions required to assess resources as commercial commodities in contrast to Indigenous perspectives on human and other-than-human relatives. While the ES framework can accommodate spiritual, cultural, aesthetic, and other non-material values through the cultural ecosystem services (CES) category, mainstream approaches - if they consider CES at all - tend to consider only the CES that can fit within the current economic valuation system, such as recreational activities.^{20,21} Approaches that partially or superficially consider CES risk supporting, rather than challenging, the dominant neoliberal approach to environmental governance.²⁰

In other words, the use of IK within existing Western-based conservation frameworks, without proper consideration for local priorities, institutions, and place-based values and relations, may lead to unfavourable results for conservation and further territorial alienation of Indigenous Peoples.²² Indigenous approaches to environmental governance are often grounded in situated relatedness, reciprocity, and respect; these values, which are linked to sustained relationships with place, should inform the development of biocultural indicators and approaches to conservation and environmental management.²³

Opportunities

Weaving knowledge systems for effective conservation and resource management

IK is dynamic and adaptive. It has changed and evolved over time, continues to do so, and can speak to global, national, and regional issues caused by environmental degrada-

tion and excessive exploitation of resources. Dialogue between Western and Indigenous sciences is a fundamental step in the governance of protected and conserved areas by Indigenous Peoples, in all contexts of shared jurisdiction, decision-making, and administration.²⁴ It is increasingly recognized that resource governance by Indigenous Peoples in their ancestral territories contributes to the conservation and sustainable use of natural resources.^{25,26} When Indigenous Peoples are on their ancestral territory, they can observe the changes and/or assess the necessary measures to nurture resilience, drawing on their historical relations with the land and water.²⁴ This recognition has led, for instance, to the establishment of the Peace-Athabasca Delta Ecological Monitoring Program, which combines IK and community-based monitoring with Western science to inform the cooperative management of Wood Buffalo National Park, in Canada.²⁷ IK can facilitate effective and equitable long-term outcomes for conservation through arrangements variously described as Indigenous Protected Areas (IPAs), Indigenous Protected and Conserved Areas (IPCAs), National Marine Conservation Areas (NMCAs), tribal parks, biodiversity reserves, and Territories and Areas Conserved by Indigenous Peoples and Local Communities (ICCAs, or 'Territories of Life'), among others.



Kennedy Lake, in Ha'uukmin Tribal Park, BC, Canada. Photo by Brett Vachon, CC BY 2.0, photo cropped, <https://bit.ly/kennedy-lake>.

In weaving Indigenous and Western Knowledge to set and monitor conservation goals, it is essential to recognise and accept the differences between the worldviews and methodologies that produce the two knowledge systems, and to question the notions of universality and objectivity that provide a privileged position to Western science.²⁸ Indigenous methodologies involve experiential, subjective, collective, and relational processes and methods, including storytelling.²⁹ For Indigenous and Western scientific knowledge systems to work in synergy, each knowledge system needs to be seen as equally relevant and valid.³⁰ Indigenous and Western scientific knowledge can complement each other, sharing information from different scales and ways of understanding.

The objective is therefore not to fit one knowledge system into another, but to consider insights and evidences from each knowledge system, even when contradictory, to inform analysis and decisions.³⁰ This requires fostering collaboration through participation at all stages, and through respectful intercultural dialogue.³⁰ The Indigenous Circle of Experts (ICE) of Canada uses the concept of ‘ethical space’ to describe where knowledge systems can interact respectfully, as equals.³¹

Supporting biocultural restoration, conservation, and monitoring

Biodiversity and the territories of Indigenous Peoples worldwide are subjected to accelerated pressures from resource extractive activities, pollution, and climate change. Such pressures simultaneously threaten traditional livelihoods, food security and sovereignty, stewardship institutions, and sacred attachments of Indigenous communities to place. Cultural and ecological restoration and conservation are therefore intertwined processes,³² sometimes described as “reciprocal restoration.”³³ Exploring the nexus between nature, culture, and well-being can help us understand “the mutually reinforcing restoration of land and culture in such a way that revival of ecosystem services contribute to cultural revitalization, and renewal of culture promotes restoration of ecological integrity.”³³ IK and cultural values reflect and inform the relationships that Indigenous Peoples maintain with their territories. Tools, methodologies, and indicators for assessing the efficiency of conservation measures should therefore reflect this knowledge and these values and relationships.

The revitalization of Indigenous languages is a key component of biocultural restoration. Indigenous languages are a central component of biocultural diversity and play an important role in protecting the world’s biodiversity.³⁴ They also make important contributions to individual and community identity, health, and well-being.³⁵ Indigenous languages derive from, and are contextualized by, place-based and land-based practices; thus, they play a fundamental role in transmitting IK on conservation and corresponding stewardship practices across generations.³⁶ Given the links between language, IK, and cultural practices, language loss threatens to weaken biodiversity stewardship. Similar impacts to language loss can be expected with increasing threats to biodiversity.

Walpole Island First Nation’s approach to the restoration of the St. Clair River, in Canada, exemplifies the connections between ecosystem restoration, IK, cultural revitalization, and language preservation. Major development sites have

been built along the St. Clair River upstream from Walpole Island First Nation’s unceded territory, resulting in pollution and water quality degradation. Walpole Island First Nation considers the river as an ancestor, whose health is tied to the well-being of the community. Walpole Island First Nation is actively participating in restoration efforts, which include water ceremonies led by women, who traditionally play a key spiritual role in fulfilling the community’s responsibility to care for water. Through water ceremonies and prayers in Anishnaabemowin, women are enacting their IK to care for the St. Clair River and, in doing so, are restoring their community’s relation to the river. Walpole Island First Nation regards healing the river as part of the process of healing itself from colonial trauma.³⁷

Policy recommendations

We call for holistic approaches to conservation, sustainable development, and decision-making. In particular, we call for the development of actions, strategies, and biocultural indicators that link biological and cultural diversity through the lens of relationships between humans and nature. Our recommendations include:

- Ensure that Indigenous ways of knowing are integral to biocultural diversity monitoring, conservation, sustainable development, and decision-making, leading to equitable outcomes.

Institutional processes should incorporate evidence and interpretations from multiple knowledge systems. These processes must fully and effectively engage IK, in full partnership with Western scientific knowledge. Weaving together Indigenous and Western sciences must also occur in contexts of respect for Indigenous institutions and authority.

To facilitate the monitoring process in Indigenous protected and conserved areas and territories, provincial/state/federal authorities should adopt policies that strengthen governance or shared governance by Indigenous Peoples.

- Develop biocultural indicators of well-being rooted in place-based cultural perspectives, values, and knowledge systems, through culturally-appropriate and ethical processes of co-development, co-validation, and knowledge co-creation.

In decision- and policy-making processes, consideration for Indigenous conceptualisations of well-being is essential to assess the cultural values of natural resources and ecosystem services, as well as to identify preferred outcomes and measures of success.

The role of natural resources or valued ecosystem components in the socio-cultural well-being of Indigenous Peoples cannot be understood without the full participation of Indigenous Peoples. Biocultural indicators should be identified through culturally-appropriate and ethical processes (an example is provided in **Box 1**).

- Develop indicators, both context-specific and generalizable, particularly those that relate to traditional livelihoods, land and marine stewardship, food and water sovereignty and security, and the relationships among cultures, economies, and ecosystems.

Interventions aiming to revive biocultural diversity must be based on indicators defined by Indigenous Peoples and researchers, their allies, and other non-Indigenous experts.

The monitoring of intervention success should also be area-specific and based on locally-developed biocultural indicators, with primary responsibility in the hands of

Indigenous Peoples.

Financial and logistical support should be provided for analyzing specific aspects of biocultural diversity, such as the links between food sovereignty and biodiversity, or between religious diversity and biodiversity.

- Increase resources available to Indigenous Peoples for engaging in biocultural diversity monitoring, conservation, sustainable development, and decision-making.

Governments at various levels should create funding opportunities for Indigenous and non-Indigenous researchers to carry out region/ecosystem/territory-specific programs for biocultural protection and revival. In particular, funding should support Indigenous-driven initiatives for cultural restoration and youth engagement as well as biocultural diversity monitoring programs, including in designated areas such as Ramsar sites and biosphere reserves.

Box 1: The following steps represent one pathway, among others, to establish appropriate biocultural indicators for reaching national and international goals for conservation:

1. Arrange appropriate working groups to fully accommodate culturally-diverse approaches to defining sustainability and resilience
2. Hold workshops in local communities to identify needs and aspirations in situ
3. Establish biocultural working groups
 - The members of the working groups should be selected by the Indigenous community, using locally and culturally appropriate participatory processes. Indigenous social institutions will guide the selection process, number of working groups necessary, and relations among them. Elders and Indigenous researchers play a key role in this stage of the process.
4. Apply Indigenous methodologies, drawing on the experience and insights of Elders and experienced land users, in the selection of biocultural indicators
 - The tools and indicators that assess the effectiveness of conservation measures should reflect relationships across local, regional, and national scales that are vital to Indigenous communities and territories.
5. Prepare biocultural protocols, for instance processes and procedures encompassing:
 - Knowledge and practices of social and cultural norms related to place-based traditional values;
 - Knowledge and practices of ceremonies, stories, songs, chants, and dance;
 - Connections within and between communities and social groups for various sharing practices, which should define the appropriate scale and scope of each indicator;
 - Innovation in practices for land management, resilience, restoration, and food security and sovereignty based on IK;
 - Routine collaboration of Indigenous and non-Indigenous researchers in working groups;
 - More information on biocultural protocols. such as the one available [here](#) and [here](#).
6. Revisit the the biocultural indicators in light of communities' evolving life projects
 - The relevant communities discuss their observations and goals in regard to well-being and ongoing life projects;
 - Locally-defined social, economic, and ecological aspects of well-being are reflected in any needed adjustments to the indicators.

Box 2: Examples of biocultural indicators provided by the Indigenous participants of the North American Dialogue on Biocultural Diversity include :

- Trend in the reintroduction of culturally-important species (i.e. buffalo), in tandem with the restoration of cultural practices, to support cultural identity
- Presence and engagement of traditional spiritual/religious societies
- Presence of Elders (as knowledge holders and mentors)
 - Presence of spaces for Elders to exchange among themselves
 - Presence of pathways for Elders to share/exchange information across generations
- Presence of active youth societies
- Ability of a community to feed themselves on their traditional territory
 - Knowledge of places, species, and methods for gardening, hunting, fishing, and gathering
 - Knowledge of traditional names of wild harvested and cultivated food and medicinal species
 - Presence of customary institutions for managing resource areas and infrastructure
- Presence of, and access to, opportunities to heal from intergenerational trauma (for instance, Elder circles)
- Presence of institutional mechanisms to support the time and resources necessary to build relationships within and between communities, to refine locally-defined research questions, and to promote research co-development and knowledge co-production
 - Maintenance of local knowledge and practices that can be communicated to others, for instance non-Indigenous collaborators
- Trend toward reclaiming and restoring spiritual terms of reverence; for instance, reclaiming the Mi'kma-ki term for "Creator" despite negative connotations/interpretations imposed by colonial powers
- Knowledge and application of animal health as an indicator of broader ecosystem health
- Knowledge and recognition of the importance of spiritual connections
- Presence of musical festivals and other cultural celebrations of music
- Trend in the availability and continued implementation of culturally-informed teacher certification programs
- Presence of indicator sets that accommodate both context-specific and generalizable indicators
- Trend in recognition of the intergenerational "peer-review" processes of Indigenous Knowledge

Funding opportunities should be made available for community programs to revive Indigenous languages. University and other research must also support the production apps, books, video games, and land-based learning, among others, to raise interest among Indigenous youth.

Indigenous research and educational institutions must be supported to develop strong projects, programs, and certifications fully recognized alongside others.

Support should also be provided to build networks and leadership initiatives for strengthening community resilience in the face of social and ecological changes on local, regional, and national scales.

Conclusion

Separating biological and cultural diversity in conservation, sustainable development, and decision-making has contributed to divergent and conflicting agendas and competing

interests. To remedy such conflicts, biological and cultural diversity must be recognized as intimately entwined and mutually reinforcing. Holistic approaches must be taken in designating protected areas and conservation territories, in methodologies for environmental monitoring, and in policy-making, dissolving the conceptual and practical separation of biological and cultural diversities. These actions can help to avoid siloed colonial approaches to conservation, sustainable development, and decision-making.

Regional and national authorities as well as research institutes and universities should support actions, strategies, and biocultural indicators that link biological and cultural diversity through the lens of relationships between humans and nature. These biocultural indicators of well-being should be rooted in place-based cultural perspectives, values, and knowledge systems. They should be both context-specific and generalizable, particularly those that relate to traditional livelihoods, land and marine stewardship,

food and water sovereignty and security, and the relationships among cultures, economies, and ecosystems.

To ensure cultural continuity and sustainability of cultural-ecological systems, Indigenous ways of knowing and governance systems must be revitalised and safeguarded. IK is integral to biocultural diversity monitoring, conservation, sustainable development, and decision-making and can lead to equitable outcomes for society at large.



Participants of the 2019 North American Dialogue on Biocultural Diversity, which informed this series of policy briefs.

Endnotes

- 1 The Atateken Declaration is available in English and in French at <http://www.cbd.int/lbcd/resources/>.
- 2 The Declaration of Belem is available in English, French, Spanish, Dutch, and Chinese at <http://www.ethnobiology.net/what-we-do/core-programs/global-coalition-2/declaration-of-belem/>.
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