State of the World's Indigenous Peoples

Climate Crisis

Volume VI

United Nations

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STATE OF THE WORLD'S INDIGENOUS PEOPLES

Volume VI

Climate Crisis

United Nations

Department of Economic and Social Affairs

The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates and analyses a wide range of economic, social and environmental data and information on which States Members of the United Nations draw to review common problems and to take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.

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Abbreviations

ABA	Asociación Bartolomé Aripaylla
ART	Architecture for REDD+ Transactions
COP	Conference of the Parties
GHG	greenhouse gas
IACHR	Inter-American Court of Human Rights
IIPFCC	International Indigenous Peoples' Forum on Climate Change
IP	intellectual property
IPCC	Intergovernmental Panel on Climate Change
ITLOS	International Tribunal on the Law of the Sea
LCDS	low-carbon development strategy
NDC	nationally determined contribution
NGO	non-governmental organization
PEMIP	Economic Empowerment Plan for Indigenous Women of Panama
REDD+	reducing emissions from deforestation and forest degradation in developing countries; the "+" stands for additional forest-related activities that protect the climate, namely sustainable management of forests and the conservation and enhancement of carbon stocks
STK	scientific and technical knowledge
TEK	technical and ecological knowledge / traditional ecological knowledge
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
2SLGBTQIA+	Two-Spirit, lesbian, gay, bisexual, transgender, queer, intersex and others who identify as part of sexual and gender-diverse communities

Photo of Torres Strait Islander climate change activists.
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Foreword

Throughout the long history of humankind, Indigenous Peoples have maintained the equilibrium of the ecosystem, showing themselves to be protectors of Mother Earth. Our knowledge, expertise and wisdom, passed down through the generations from our elders to our youth, have taken care of our people and our planet.

But today our existence as Indigenous Peoples is under threat. The climate crisis is leading to worrying levels of biodiversity loss and the destruction of vital ecosystems, which in turn are endangering Indigenous Peoples' livelihoods, cultures, and languages. Indigenous Peoples across the world are on the front lines of climate change and are often among the hardest hit by its impact – despite having contributed the least to carbon emissions.

The United Nations Declaration on the Rights of Indigenous Peoples provides a global framework for dialogue and cooperation between States and Indigenous Peoples. The Declaration acknowledges the important contributions of Indigenous Peoples' knowledge, cultures and traditional practices to sustainable and equitable development and effective environmental management. The United Nations Permanent Forum on Indigenous Issues has on numerous occasions highlighted the critical role Indigenous languages play in the transmission of knowledge systems, practices, and beliefs that can and do, contribute to addressing the climate crisis. The Forum also recognizes that the right to a clean, healthy and sustainable environment goes hand in hand with Indigenous Peoples' collective right to self-determination and autonomy.

So-called green solutions often pose as much of a threat to Indigenous Peoples as the climate crisis itself. The growing demand for minerals critical to the green energy transition has led to heavy mining activity of Indigenous Peoples' lands and territories – very often without their free, prior and informed consent. If the disruption of the natural equilibrium continues, Indigenous Peoples around the world will continue to actively resist mining projects and other environmentally disruptive practices in these lands and territories.

The green transition can be a just transition. Indigenous Peoples have much to offer in terms of concrete solutions to tackle the climate crisis. Indigenous-led conservation can restore soils, reduce carbon emissions, and ensure sustainable food production. Indigenous Peoples' stewardship of the natural environment prioritizes human and planetary health and values equity, justice and sustainability. We have proven that our economies are resilient and that our foods and goods can be produced in a sustainable and equitable manner. Our ways of living have shown how it is possible to live in harmony with Mother Earth rather than destroying her.

The sixth edition of the State of the World's Indigenous Peoples is timely, given the growing urgency of the climate crisis and the need for action. Indigenous Peoples are steadily gaining recognition on the global stage, including at climate change conferences, and there is broader acknowledgement of the critical knowledge and invaluable solutions they can bring to the table to combat climate change.

While growing recognition is a step in the right direction, the best way to support Indigenous Peoples in their efforts to protect our planet is to ensure that they have direct access to the financial resources needed to ensure their self-determination in addressing the impacts of climate change through actions such as managing the environment responsibly and achieving a sustainable economy and food sovereignty. Direct, long-term funding to Indigenous Peoples is essential for scaling up climate mitigation efforts, realizing the aims of the Paris Agreement and the Kunming-Montreal Global Biodiversity Framework, and delivering on the promises of the Sustainable Development Goals.

In my role as Chairperson of the United Nations Permanent Forum on Indigenous Issues, I will continue to use my voice to call for greater participation of Indigenous Peoples in future Conferences of the Parties to the United Nations Framework on Climate Change and to strive for climate justice for all Indigenous Peoples across the globe.

Although we are disproportionately affected by the climate crisis, Indigenous Peoples are not victims. We are custodians of the natural world who are committed to maintaining the natural equilibrium of the planet for the generations to come. We are in the best position to offer solutions based on our Indigenous knowledge and technology, which can contribute to slowing and even reversing the effects of climate change for the benefit of all. We just need the world to listen.

Hindou Oumarou Ibrahim

Chairperson
United Nations Permanent Forum
on Indigenous Issues

Overview

The United Nations Permanent Forum on Indigenous Issues is an advisory body to the United Nations Economic and Social Council with a mandate to address Indigenous issues relating to economic and social development, culture, the environment, education, health, and human rights. This mandate includes raising awareness of and promoting the integration and coordination of activities related to Indigenous issues within the United Nations system; preparing and disseminating information on Indigenous issues; promoting respect for and full application of the provisions of the United Nations Declaration on the Rights of Indigenous Peoples; and following up on the effectiveness of the Declaration. At its first session in 2002, the Permanent Forum called on the United Nations to produce a report on the state of the world's Indigenous Peoples, to highlight key issues linked to the thematic areas of the Permanent Forum's mandate. The first volume, published in 2009, addressed all six of the areas identified in the mandate. Subsequent volumes have delved more deeply into specific areas of priority for Indigenous Peoples, highlighting access to health services (2015), education (2017), the implementation of the United Nations Declaration on the Rights of Indigenous Peoples (2019), and Indigenous Peoples' rights to their lands, territories and resources (2021). The 2024 edition focuses on the vital role of Indigenous Peoples in addressing the impacts of climate change.

Although Indigenous Peoples account for only around 6 per cent of the world's population, they effectively manage and protect an estimated 80 per cent of the Earth's biodiversity and about 40 per cent of protected areas and ecologically intact landscapes. Since Indigenous Peoples first came to the United Nations, they have emphasized the fundamental importance of their relationship with their lands, territories and resources, which hold a deep cultural and spiritual significance within their societies.

In an expert group meeting report presented at the ninth session of the United Nations Permanent Forum on Indigenous Issues in 2010, it is noted that "the climate change crisis is a direct result of the unabated dumping of greenhouse gases into the atmosphere, caused by a fossil-fuel-based economic model and the over-exhaustion of natural resources such as forests, peat lands, grasslands, soils, and the like. Indigenous Peoples disproportionately suffer from the serious impacts of climate change because they are mainly dependent on the integrity of their ecosystems for their survival and because of their impoverishment."[1] The repercussions of the climate crisis are being felt deeply among Indigenous Peoples across the world, with Indigenous women particularly affected due to their central role as caregivers, knowledge keepers and resource managers with an intimate connection to their natural environment.

This sixth volume of the State of the World's Indigenous Peoples focuses on the climate crisis, its impact on Indigenous Peoples, and the role Indigenous Peoples can and do play in mitigating the effects of climate change. It aims to provide a comprehensive overview of current and emerging issues in the context of the climate crisis from the perspective of Indigenous Peoples. Drawing on illustrative examples from across the seven sociocultural regions, the publication highlights both challenges and good practices linked to Indigenous Peoples' experiences with and responses to, the ongoing climate crisis. Ultimately, this report is intended to serve as an authoritative reference and advocacy tool for Indigenous Peoples and civil society organizations and to contribute to the broader conversation around climate change mitigation, adaptation and resilience.

Chapter 1 – The languages, culture, wisdom, and scientific and technical knowledge of Indigenous Peoples within the context of the climate crisis

Chapter 1, written by Susan Chiblow, explores the interconnected nature of Indigenous Peoples' languages, cultures, wisdom, and scientific and technical knowledge

1 United Nations, Economic and Social Council, "Indigenous peoples: development with culture and identity – articles 3 and 32 of the United Nations Declaration on the Rights of Indigenous Peoples", report of the international expert group meeting, 5 February 2010 (E/C.19/2010/14), para. 26.

and examines how they are being affected by the climate crisis. Indigenous Peoples' knowledge systems, which are embedded in their languages and cultures, are grounded in a holistic, all-encompassing relationship with the universe, reflecting their commitment to living in harmony with nature.

The chapter explores the role Indigenous Peoples currently play and the expanded role they are capable of assuming, in addressing the climate crisis. Drawing on historical and contemporary examples, the chapter illustrates the important contributions made by Indigenous Peoples to environmental protection and demonstrates the value of their languages and cultures in safeguarding vital information related to climate change mitigation.

The chapter emphasizes the urgent need to support Indigenous-led programmes for the protection and promotion of Indigenous languages, cultures, and scientific and technical knowledge. Recommendations for policymakers are provided to ensure that Indigenous Peoples' scientific and technical knowledge is fully leveraged and integrated into climate change mitigation efforts at the national, regional and global levels, grounded in the principles of free, prior and informed consent.

Chapter 2 – World Health Organization: the impact of climate change on the health of Indigenous Peoples

Chapter 2, drawn from a review commissioned by the World Health Organization (WHO), focuses on the impact of climate and environmental changes on Indigenous Peoples' health and well-being. Through a comprehensive literature review, the chapter explores the profound personal relationship Indigenous Peoples have with the physical landscape and examines how, as ecosystems transform, these relationships are disrupted, with serious repercussions for their physical, emotional and spiritual health.

The chapter identifies health-related risks linked to the detrimental effects of climate change, including specific risks to Indigenous women and girls. It is emphasized that Indigenous Peoples are not vulnerable by nature; rather, they are placed in situations of vulnerability as a result of social, economic and ethnic discrimination and are further disadvantaged by the impacts of climate change. The focus is not wholly on challenges, however; the review emphasizes the resilience and adaptability of Indigenous Peoples and calls for greater support for localized, Indigenous-led adaptations to new realities emerging as a result of climate shifts.

The findings of the chapter are threaded together by an overarching understanding that climate-related health impacts are rooted in and inseparable from, Indigenous Peoples' connections to place. Environmental health and human health are inextricably linked. The chapter argues that because of this indivisibility, it is critical to establish a framework for Indigenous determinants of health that incorporates a repositioning of human engagement with the environment and accounts for Indigenous conceptualizations of health and well-being.

Chapter 3 – The impact of climate change mitigation efforts on the lands, territories, environment, and resources of Indigenous Peoples

In line with the United Nations Declaration on the Rights of Indigenous Peoples, the Permanent Forum has emphasized that Indigenous Peoples must be able to fully participate in all climate change mitigation projects and policies that involve or affect their lands, resources and ways of life, now or in the future. The present reality is that in the push for profits from the green technology and energy transition, Indigenous Peoples' lands and territories are becoming polluted and contaminated by toxic substances.

Chapter 3, written by Max Ooft, looks at contemporary climate mitigation processes that can be detrimental to Indigenous Peoples, highlighting false solutions that are negatively affecting Indigenous Peoples and their traditional knowledge, languages, ecosystems and health. Using case studies from around the world, the chapter illustrates both positive and negative country experiences in implementing climate change mitigation initiatives.

The chapter also examines the growing importance of climate financing – and the fact that only a small portion of the funding provided for mitigation and adaptation efforts is earmarked for Indigenous Peoples, with the resources almost always disbursed through intermediaries. It highlights the lack of direct financing for Indigenous Peoples' organizations and concludes with key recommendations outlining changes that need to be made.

Chapter 4 – The impact of climate change on Indigenous economies

Chapter 4, written by Edna Kaptoyo, offers some insights on how the climate crisis is affecting the economies of Indigenous Peoples given their close connection to the environment and its natural resources. Indigenous economies are regenerative and sustainable in nature; they are not driven by financial profit but rather grounded in the cosmovisions of Indigenous Peoples, which prioritize community-led practices, the sustainable management of lands and resources, and a keen awareness of the impact humans have on the environment.

Drawing on examples from the seven sociocultural regions, the chapter underlines Indigenous Peoples' commitment to responsible economic development – despite the increasing pressure they face to conform to the global market economy and despite growing climate action efforts threatening their lands and resources.

By demonstrating the strengths of Indigenous economic models through examples of good practice, the chapter provides policymakers with concrete solutions showing how to incorporate sustainable Indigenous economies into climate change mitigation efforts and thereby create a more inclusive economy based on respect and trust.

Chapter 5 – The engagement of Indigenous Peoples in international climate change advocacy and policymaking

Chapter 5, written by Johnson Cerda, examines the progress Indigenous Peoples have made in carving out a space for themselves in the international climate change arena and highlights some of the challenges they continue to face in securing a seat at the table in negotiations linked to key international conventions. While Indigenous Peoples have only been allowed to participate as observers in climate conventions and declarations, they have nevertheless played a critical role in shaping key environmental texts, including the Paris Agreement and the Convention on Biological Diversity.

This final chapter provides an in-depth analysis of Indigenous Peoples' working groups and platforms, highlighting their effective approaches to advocacy in international climate change processes and providing concrete recommendations on how their participation can continue to be strengthened.

Author profiles

Susan Chiblow holds a Bachelor of Science in biology, a Master of Science in environment and management, and a Ph.D. in environmental science with a specialization in *N'bi Kendaaswin* (water knowledge). Over the past 30 years, she has dedicated her efforts to working with First Nations communities and Elders, striving to protect the environment. Currently, she serves as an Anishinaabe advisor on environmental projects and policy analysis. Chiblow is an expert in Anishinabek law development, watershed planning, and traditional ecological knowledge. She has contributed to drafting international documents for the United Nations and special rapporteurs focusing on Indigenous Peoples' issues.

Max Ooft has over 20 years of experience advocating for Indigenous Peoples' rights in both national and international Indigenous Peoples' organizations, as well as through development work at the United Nations Development Programme office in Suriname. Ooft has been active in local community development, programme design, and the implementation and evaluation of human-rights-based approaches to sustainable development. He has contributed to, inter alia, the UNDP policy on Indigenous Peoples and the UNESCO policy on engagement with Indigenous Peoples.

Edna Kaptoyo is a social development specialist with extensive experience in advocacy, global environmental law, and policymaking. She is an active member of the Indigenous Peoples Caucus and the national gender and climate change working group in Kenya, as well as other national and international platforms addressing Indigenous issues. Throughout her career, Kaptoyo has advocated for Indigenous Peoples' rights, participating in initiatives such as water catchment restoration by Indigenous women and documenting best adaptation practices in Indigenous communities.

Johnson Cerda is the Senior Director of the Dedicated Grant Mechanism for Indigenous Peoples and Local Communities. He has a long-standing history of working with Indigenous Peoples' organizations and Ecuadorian government institutions involved in Indigenous Peoples' issues. Cerda has served as a member of the Global Environment Facility (GEF-NGO) committee representing Indigenous Peoples of Latin America and as a member of the Panel of Experts for the Forest Carbon Partnership Facility of the World Bank. He has also co-directed the Amazon Alliance and participated in UNFCCC negotiations for over 20 years, consistently advocating for Indigenous Peoples' rights throughout his career.

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Yolngu woman participating in ceremony, also known as bunggul (traditional dance). Credit: Melanie Faith Dove/Yothu Yindi Foundation

Chapter 1 - The languages, cultures, wisdom, and scientific and technical knowledge of Indigenous Peoples within the context of the climate crisis

Chapter 1 - The languages, cultures, wisdom, and scientific and technical knowledge of Indigenous Peoples within the context of the climate crisis

This chapter explores Indigenous Peoples' languages, cultures, wisdom, and scientific and technical knowledge in relation to the climate crisis. It presents case studies from across the globe, providing examples of good practice, and offers guidance for policymakers on how to ensure that Indigenous Peoples' scientific and technical knowledge is included in climate change mitigation efforts at the national, regional and global levels. Tools and possible solutions to facilitate the recognition and protection of Indigenous Peoples' languages, cultures, wisdom, and scientific and technical knowledge are presented, grounded in the principles of free, prior and informed consent. An interconnectivity analysis informs the conclusions and recommendations at the end of the chapter.

1.1 The scientific and technical knowledge of Indigenous Peoples

In a 2001 journal article on Indigenous Australian participation in science, Lester Rigney offered the following observations:

> We can assert that the colonists saw themselves as the scientists. If one's racial superiority could be scientifically legitimated, then the logical conclusion could be drawn that the scientific methods used in "other" cultures to investigate or transmit knowledges were inferior and irrational. Indigenous intellectual traditions and knowledge transmission, which sustained Indigenous cultures and humanity for thousands of years, were not considered worthy science or even science at all.[2]

Over the past several decades, acknowledgement of the importance of Indigenous knowledge has gained some traction. The use of terms such as "scientific" and "technical" to describe Indigenous knowledge has emerged in part from the growing recognition that Indigenous Peoples all over the world have sustainable environmental knowledge and practices that can be used to address local and global problems facing modern society.[3] In 1987, the *Report of the World Commission on Environment and Development: Our Common Future* (the Brundtland Report) recognized the important role of Indigenous Peoples in sustainable development.[4] Five years later, at the United Nations Conference on Environment and Development, the legally binding Convention on Biological Diversity was signed, calling for the recognition and wider utilization of Indigenous knowledge, innovations, technologies and practices relevant to the conservation of biological diversity. Chapter 26 of Agenda 21 reiterates the important role of Indigenous Peoples and their scientific knowledge in achieving environmentally sound resource management

2 Lester-Irabinna Rigney, "A first perspective of Indigenous Australian participation in science: framing Indigenous research towards Indigenous Australian intellectual sovereignty", *Kaurna Higher Education Journal*, vol. 7, No. 1 (2001), p. 4.

3 Linda Clarkson, Vern Morrissette and Gabriel Régallet, *Our Responsibility to the Seventh Generation: Indigenous Peoples and Sustainable Development* (Winnipeg, Canada, International Institute for Sustainable Development, 1992), pp. 63-67, available at https://www.iisd.org/system/files/publications/seventh_gen.pdf.

4 World Commission on Environment and Development, *Report of the World Commission on Environment and Development: Our Common Future* [The Brundtland Report] (1987), available at https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf.

Navajo teacher and students studying in the classroom. Credit: Canva

and sustainable development.[5] With formal United Nations recognition, interest in Indigenous scientific and technical knowledge has grown; however, because there is no universally accepted definition of such knowledge, it is referred to and understood in many different ways. At the most fundamental level, the scientific and technical knowledge of Indigenous Peoples is location-based and specific to each community and derives from their intimate relationship with their environment and territory from time immemorial. Underlying this dynamic are deeper and more complex concepts that often prove difficult to capture in non-Indigenous languages.

As the importance of Indigenous scientific and technical knowledge in decision-making processes has evolved, so have the words used to describe such knowledge. Terms such as Aboriginal traditional knowledge, traditional ecological knowledge, traditional knowledge, and traditional environmental knowledge have been used[6] – though these are not Indigenous Peoples' terms. It is important to understand that "terms like traditional knowledge don't encompass the complex and nuanced web of spiritual, cultural, scientific, philosophical, and abstract understandings found in Indigenous worldviews. There's no word or phrase in the English language that can give these concepts of relational knowledge the justice they deserve, and each Peoples have their own ways of knowing that would need to be labelled via their respective languages."[7]

5 United Nations, Agenda 21, United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3 to 14 June 1992, available at https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.

6 Deborah McGregor, "Indigenous knowledge systems in environmental governance in Canada", *Knowledge Creation, Dissemination, and Preservation Studies - Special Issue: Indigenous Knowledges*, vol. 5, No. 1 (2021), available at https://doi.org/10.18357/kula.148.

7 Animikii, "Decolonizing digital: empowering indigeneity through data sovereignty", Animikii blog, para. 2 (Animikii, Indigenous Innovation, 2019).

For the reasons outlined above, defining Indigenous scientific and technical knowledge using non-Indigenous languages such as English can be problematic. There are different words or terms used to describe Indigenous Peoples and the world, and meanings are often lost in translations between Indigenous and non-Indigenous languages.[8] For instance, the English word "knowledge" does not translate easily into many Indigenous languages, in part because English is a noun-rich linguistic system, while a common feature of many Indigenous languages is that they are verb-rich and focus more on conveying a sense of action.[9] Potawatomi botanist Robin Wall Kimmerer elaborates: "A bay is a noun only if water is dead. When bay is a noun, it is defined by humans, trapped between its shores and contained by the word. But the verb *wiikwegamaa* – to be a bay – releases the water from bondage and lets it live. … This is the grammar of animacy."[10]

This action-oriented view of the world emphasizes relationships – a relationality – between the speaker, human, more than human, and the local environment. Translations of "knowledge" from or into Indigenous languages that perhaps come closest to capturing the essence of the concept include "ways of living", "ways of being and knowing", and "ways of relating to the lands, waters, and cosmos".[11] It is important for speakers of mainstream languages such as English to have a deeper and more nuanced understanding of what scientific and technical knowledge is in Indigenous contexts in order to work with Indigenous Peoples and their knowledge in decision-making.

1.1.1 Definitions

In a background document prepared for the 2019 session of the United Nations Permanent Forum on Indigenous Issues, traditional knowledge is defined as follows:

> **Traditional knowledge refers to the knowledge, innovations and practices of Indigenous peoples. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is often transmitted orally from generation to generation. It tends to be collectively owned and can be expressed in stories, songs, folklore, proverbs, cultural values, beliefs, rituals, etc. It is also the source for the traditional use and management of lands, territories and resources, with Indigenous agricultural practices that care for the earth without depleting the resources. Indigenous peoples follow oral traditions, with dances, paintings, carvings and other artistic expressions, that are practiced and passed down through millennia. … Traditional knowledge is at the core of Indigenous Peoples' identities, cultural heritage and livelihoods. The transmission of traditional knowledge across generations is fundamental to protecting and promoting Indigenous peoples' cultures and identities … as well as the sustainability of livelihoods, resilience to human-made and natural disasters, and sustaining culturally appropriate economic development. Traditional knowledge underlines Indigenous Peoples' holistic approach of life, which is a central element of the world's cultural and biological diversity.**[12]

According to Douglas Nakashima and others,[13] "indigenous or traditional knowledge refers to the knowledge and know-how accumulated across generations, and renewed by each new generation, which guide human societies in their innumerable interactions with their surrounding environment".

Deborah McGregor defines technical and ecological knowledge (TEK) as the "relationships between knowledge, people, and all Creation (the 'natural' world

8 Susan Chiblow and Paul J. Meighan, "Language is land, land is language: the importance of Indigenous languages", *Human Geography*, vol. 15, No. 2 (July 2022), pp. 206-210, available at https://doi.org/10.1177/19427786211022899.

9 Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants* (Minneapolis, Minnesota, Milkweed Editions, 2013).

10 Ibid., p. 55.

11 Glen Aikenhead and Herman Michell, Bridging Cultures: *Indigenous and Scientific Ways of Knowing Nature* (Ontario, Pearson Canada, 2011).

12 United Nations Permanent Forum on Indigenous Peoples, "Backgrounder – traditional knowledge", paras. 2 and 3, available at https://social.desa.un.org/sites/default/files/migrated/19/2019/04/Traditional-Knowledge-backgrounder-FINAL.pdf.

13 Douglas Nakashima and others, *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation* (Paris and Darwin, Australia, UNESCO and United Nations University Traditional Knowledge Initiative, 2012).

as well as the spiritual). TEK is viewed as the process of participating (a verb) fully and responsibly in such relationships, rather than specifically as the knowledge gained from such experiences. For Aboriginal people, TEK is not just about understanding relationships; it is the relationship with Creation. TEK is something one does."[14] Kyle Powys Whyte describes technical and ecological knowledge as a collaborative concept, asserting that "TEK systems … are systems of responsibilities that arise from particular cosmological beliefs about the relationships between living beings and non-living things or humans and the natural world".[15]

In Africa, Indigenous knowledge is experiential knowledge based on a worldview and culture that are fundamentally relational. The African worldview is built around concepts such as wholeness, community, and harmony, which are deeply embedded in cultural values.[16] Central to the African worldview is a strong orientation towards communal values and concordance rooted in a collective sense of responsibility – a "collective ethic" – based on the understanding that the survival of the group derives from the harmony achieved through interdependence and interconnectedness.[17] In Oceania, the Māori use the modern term *mātauranga* to describe scientific and technical knowledge as the combined knowledge of Polynesian ancestors and the experiences of Māori living in the environment of Aotearoa. In a traditional sense, *mātauranga* Māori refers to the knowledge, comprehension, or understanding of everything visible and invisible that exists within the universe.[18] This concept is manifested in many forms, including language (*te reo*), education (*mātauranga*), traditional environmental knowledge (*taonga tuku iho, mātauranga o te taiao*), traditional knowledge of cultural practices such as healing and medicines (*rongoā*), fishing (*hī ika*), and cultivation (*mahinga kai*).[19]

Indigenous scientific and technical knowledge is a distinctive, time-tested, method-driven knowledge system that can enhance and complement Western science.[20] It centres around Indigenous Peoples' knowledge of and relationship with the ecosystem and the environment. It derives from their direct experiences and interactions with biophysical and ecological processes over the course of human history and includes multiple knowledge systems that encompass a comprehensive understanding of plants and agriculture, the behaviour of aquatic and terrestrial animals (including birds), weather patterns, ecosystem functions, habitat use, community interactions,[21] and water availability and management[22] – all of which are relevant to climate change. The term "scientific and technical knowledge" (rather than the more common term "traditional knowledge") is used in the present report in response to calls to avoid language that devalues the ideas, knowledge, technology and science of Indigenous Peoples. The scientific and technical focus emphasizes that Indigenous knowledge is based on observation and is contemporary and dynamic rather than static and fixed in time. Indigenous knowledge comprises a sophisticated set of understandings of no less value than the knowledge that has served as the foundation for Western science. There are many valid "sciences" in the world, and a growing number of researchers and scientists are calling for the integration of Indigenous scientific and technical knowledge alongside Western scientific knowledge in efforts to protect the world's natural resources and mitigate the impacts of climate change.

14 Deborah McGregor, "Linking traditional ecological knowledge and Western science: Aboriginal perspectives from the 2000 State of the Lakes Ecosystem Conference", *The Canadian Journal of Native Studies*, vol. 28, No. 1 (2008), pp. 145-146, available at https://cjns.brandonu.ca/wp-content/uploads/28-1-06McGregor.pdf.

15 Kyle Powys Whyte, "On the role of traditional ecological knowledge as a collaborative concept: a philosophical study", *Ecological Processes,* vol. 2, No. 7 (2013), p. 5, available at https://doi.org/10.1186/2192-1709-2-7.

16 Frances E. Owusi-Ansah and Gubela Mji, "African indigenous knowledge and research", *African Journal of Disability,* vol. 2, No. 1 (2013), pp. 1-5, available at http://dx.doi.org/10.4102/ajod.v2i1.30.

17 Queeneth Mkabela, "Using the Afrocentric method in researching indigenous African culture", *The Qualitative Report*, vol. 10, No. 1 (2005), pp. 178-189, available at https://doi.org/10.46743/2160-3715/2005.1864.

18 Weno Iti and Apanui Skipper, " Mātauranga Māori and science", available at https://www.sciencelearn.org.nz/resources/2545-matauranga-maori-and-science.

19 Ibid.

20 Daniele Conversi, "Exemplary ethical communities: a new concept for a livable Anthropocene", *Sustainability*, vol. 13, No. 10 (2021), 5582, available at https://doi.org/10.3390/su13105582.

21 For a more exhaustive list of contributions to ecology and evolution, see Tyler D. Jessen and others, "Contributions of Indigenous knowledge to ecological and evolutionary understanding", *Frontiers in Ecology and the Environment,* vol. 20, No. 2 (November 2021), pp. 93-101, available at https://dspace.library.uvic.ca/items/2426596f-e0d0-46a5-9e0c-f21719fe8c47.

22 Canada, Species at Risk Act (S.C. 2002, c. 29), available at https://laws.justice.gc.ca/eng/acts/s-15.3/page-2.html.

Indigenous scientific and technical knowledge is community-specific and place-based and has evolved out of the intimate relationship of Indigenous Peoples with their environment and territory over thousands of years. It is generally understood to be a body of collective knowledge that encompasses community values, teachings, relationships, ceremonies, oral stories, and belief systems. It is cumulative and dynamic, drawing from and building on the experiences of earlier generations, informing the practices of current generations, and evolving in the context of contemporary society to ensure sustainability for future generations.

Indigenous scientific and technical knowledge systems are diverse and dynamic, and all in their own way have stood the test of time. They deserve equal footing with other recognized knowledge systems, including Western science. It is important to understand that while there are certain common threads that run through Indigenous scientific and technical knowledge (including spirituality, ceremony, reciprocity, and relationships with and responsibilities to the community and the Earth), the concept can otherwise be quite fluid. For example, Indigenous scientific and technical knowledge is not limited to land use, and while Indigenous practices are often referred to as "traditional", they remain relevant and adaptable today. Indigenous scientific and technical knowledge is not monolithic; it is understood and applied in various ways by different communities and even by individuals within the same community depending on factors such as sex or gender orientation, spiritual beliefs, socioeconomic class, age, or marital status.

1.1.2 Context

For Indigenous Peoples and communities across the globe, lands and territories (including waters and ice) are seen as "a data source, a teacher, and [a] spiritual guide".[23] A number of scholars have observed that Indigenous Peoples were generating, transmitting, and applying information about the natural world long before scientific inquiry was formalized.[24] While this information might not be collected or disseminated using modern data approaches, the knowledge acquired is no less valuable or valid, as it derives from long-term collective relationships and responsibilities centred around the lands and environment in which Indigenous Peoples have lived.

Because Indigenous scientific and technical knowledge is all-encompassing, it has sustained Indigenous Peoples' communities in every part of the world for millennia. Gregory Cajete, a Tewa educator and scholar, defines Indigenous science as "a broad category that includes everything from metaphysics to philosophy to various practical technologies practiced by Indigenous Peoples past and present … [and, like Western science,] has models which are highly contextual to tribal experiences, representational and focused on higher order thinking and understanding".[25]

Cajete maintains that Indigenous scientific and technical knowledge includes the nature of language, thought and perception, the nature of time, human feeling and knowing, interconnectedness, and relationships to the cosmos. It is a journey and a form of coming to know.[26] It is more than just ecological knowledge; it is a way of life – the actual way of living that life based on holistic, all-encompassing Indigenous knowledge.[27] In contrast to Western science, which focuses on the "discovery of knowledge" and attribution to the discoverer in the form of a published record or patent, Indigenous "coming to know" is a shared journey of collective wisdom in action.[28] Living in harmony with nature ensures the continuance of the community, as nature supplies the blueprint for peaceful coexistence and provides all that is

23 Deborah McGregor, Jean-Paul Restoule and Rochelle Johnston, eds., *Indigenous Research: Theories, Practices, and Relationships* (Toronto, Canadian Scholars, 2018), p. 116.

24 See, for example, Gregory Cajete, *Native Science: Natural Laws of Interdependence* (Santa Fe, New Mexico, Clear Light Publishers, 1995); Deborah McGregor, "Coming full circle: Indigenous knowledge, environment, and our future", *The American Indian Quarterly*, vol. 28, No. 3 & 4 (fall 2004), pp. 385-410, available at https://doi.org/10.1353/aiq.2004.0101.

25 Gregory A. Cajete, *Igniting the Sparkle: An Indigenous Science Education Model* (Skyland, North Carolina, Kivaki Press, 1999), p. 81.

26 F. David Peat, *Lighting the Seventh Fire: The Spiritual Ways, Healing, and Science of the Native American* (Birch Lane Press, 1994).

27 Deborah McGregor, "Traditional ecological knowledge and sustainable development: towards coexistence", in *In the Way of Development: Indigenous Peoples, Life Projects and Globalization*, Mario Blaser, Harvey A. Feit and Glenn McRae, eds. (London and New York, Zed Books, 2004), pp. 72-91.

28 Glen S. Aikenhead and Masakata Ogawa, "Indigenous knowledge and science revisited", *Cultural Studies of Science Education*, vol. 2, No. 3 (2007), pp. 539-620, available at http://dx.doi.org/10.1007/s11422-007-9067-8.

necessary to sustain life.[29] Living in deep accord with the natural world minimizes human-driven climate change. Speaking at the opening of the eighteenth session of the United Nations Permanent Forum on Indigenous Issues in 2019, General Assembly President María Fernanda Espinosa observed that "traditional knowledge occupies a pivotal place in the range of actions needed to mitigate climate change".[30] Indigenous Peoples must be involved in the development of climate change solutions, as their scientific and technical knowledge is built upon time-tested approaches proven to preserve environmental integrity and sustainability.

1.1.3 Key advances linked to Indigenous Peoples' scientific and technical knowledge

Examples of how Indigenous scientific and technical knowledge has contributed to societal development and environmental conservation span several millennia.

Indigenous Peoples in the Andes have been cultivating potatoes on their mountain slopes for at least 4,000 years.[31] Andean farmers invented the first freeze-dry method of preserving potatoes by putting them out in sub-zero temperatures at night.[32] Cajete notes that "even before the Incas, these natives produced high yields of potatoes from small plots of land, and they developed different kinds of potatoes for every type of soil, sun, elevation and moisture condition. Colors ranged from whites and yellows through purples, reds and browns."[33]

The Mayans in south-central Mexico first cultivated corn from a wild grass called teosinte about 9,000 years ago. Indeed, the earliest calendars were devised by Indigenous Peoples of Central and South America to track corn planting and harvesting.[34] The Indigenous Peoples of the Americas also developed waterproof bags and the original gumboots using the sap of several kinds of rubber,[35] and they were the first to utilize rubber for waterproofing boats.[36]

Modern synthetic pesticides are harmful to humans and entire ecosystems, but Indigenous farmers and scientific and technical knowledge practitioners throughout India and Africa have known about the insecticidal properties of the neem tree for centuries. Traditional pest control systems were once widely used in these regions. Even now, farmers in Niger and Mali utilize neem tree leaves to prevent locust attacks.[37]

Specific to climate change, Indigenous Peoples have used their scientific and technical knowledge to identify changes in animal and plant life cycles, the timing of bird migrations, wildlife hibernation patterns, water levels and temperatures, the timing and duration of snow cover, and other environmental phenomena. In northern Canada, Indigenous scientific and technical knowledge was initially used in conjunction with Western science to document observations of climate and environmental changes.[38] More recently, such knowledge has been incorporated in community-based studies led by Indigenous Peoples to assess exposure and vulnerability to climate change and identify potential adaptation strategies.[39] The Yup'ik People in south-western Alaska (in the north-western United States) have developed specific types of technology for dealing with the harsh conditions of the tundra. In the mid-1990s, researchers observed that their technology – including inventions such as the kayak, fish traps, and a wide range of hunting and fishing gear – "could not have been developed without extensive scientific study of the flow of currents

29 Herman Michell, "Nēhîthâwâk of Reindeer Lake, Canada: worldview, epistemology and relationships with the natural world", *Australian Journal of Indigenous Education*, vol. 34, No. 1 (2005), pp. 33-43.
30 United Nations, "Indigenous People's traditional knowledge must be preserved, valued globally, speakers stress as Permanent Forum opens annual session", press release, 22 April 2019, available at https://press.un.org/en/2019/hr5431.doc.htm.
31 Jack Weatherford, *Indian Givers: How the Indians of the Americas Transformed the World* (Crown Publishing Group, 1988).
32 Ibid.
33 Cajete, *Native Science: Natural Laws of Interdependence*, p. 135.
34 Dolores R. Piperno, "The origins of plant cultivation and domestication in the new world tropics: patterns, process, and new developments", *Current Anthropology*, vol. 52, No. S4 (October 2011), pp. S453-S470, available at http://dx.doi.org/10.1086/659998.
35 Cajete, *Native Science: Natural Laws of Interdependence*.
36 Jack Weatherford, *Indian Givers: How the Indians of the Americas Transformed the World* (Crown Publishing Group, 1988).
37 John Emsley, "Piecing together a safer insecticide", *New Scientist*, vol. 132, No. 1798 (1991), p. 24.
38 Dyanna Riedlinger and Fikret Berkes, "Contributions of traditional knowledge to understanding climate change in the Canadian Arctic", *Polar Record*, vol. 37, No. 203 (2009), pp. 315-328.
39 National Collaborating Centre for Indigenous Health, *Climate Change and Indigenous Peoples' Health in Canada* (Prince George, British Columbia, Canada, 2022), reprinted with permission from Canada, *Health of Canadians in a Changing Climate: Advancing our Knowledge for Action*, P. Berry and R. Schnitter, eds., available at https://www.nccih.ca/Publications/Lists/Publications/Attachments/10367/Climate_Change_and_Indigenous_Peoples_Health_EN_Web_2022-03-22.pdf.

in the rivers, the ebb and flow of tides in bays, and the feeding, sleeping, and migratory habits of fish, mammals, and birds".[40] Other researchers have found that the Tunpu Peoples of Baojiatun, in south-western China, make long-term observations of all natural elements. From their knowledge of natural phenomena, they are able to provide practical guidance on water management, disaster resistance, and planting and breeding.[41] As the scientific and technical knowledge of Indigenous Peoples' communities continues to evolve, so will their contributions to addressing climate change.

1.2 The need to protect the languages, cultures, and scientific and technical knowledge of Indigenous Peoples

The languages, cultures, and scientific and technical knowledge of Indigenous Peoples – all of which are integral to global efforts to combat climate change – are under threat from ongoing colonialism and exploitation and shifting climate patterns. The value of these assets – which provide the foundation for Indigenous Peoples' extensive knowledge of biodiversity and environmental dynamics – is well documented, and they must be protected if Indigenous Peoples are to contribute meaningfully to climate change mitigation efforts.[42],[43]

1.2.1 Indigenous languages: context

There are close to half a billion Indigenous persons living in 90 countries across the globe.[44] Indigenous Peoples speak two thirds of the world's 7,000 known oral languages.[45] For Indigenous Peoples, language and culture are viewed as one and the same and as inseparable from the land.[46],[47] Although Indigenous Peoples' communities in different parts of the world have very diverse cultures, languages, and traditions, they share some common values, including stewardship of the land and a respect for the Earth and all its inhabitants.[48] For Indigenous Peoples, protecting the environment is not just an intellectual exercise. Wilma Mankiller, a staunch activist for Indigenous rights, explains that when Indigenous Peoples "speak of preserving the land for future generations, they are not just talking about … humans. They are talking about future generations of plants, animals, water, and all living things."[49] The language they use reflects this sacred cultural imperative.

Aristotelian logic and Cartesian thinking – both of which have played a major role in shaping the philosophies, value systems, and conceptual frameworks of Western society and Western science – are generally not reflected in Indigenous worldviews.[50] The Cartesian division between mind (or spirit) and matter does not exist in Indigenous languages or worldviews. This binary separation of the human mind (spirit) and "reason" from matter, from animals with no "reason" or "language", and from a material, "soulless" environment has dominated Western thinking, particularly in the intellectual and scientific realms, and has effectively normalized colonialism, imperialism, and environmental

40 Angayuqaq Oscar Kawagley, Delena Norris-Tull and Roger Norris-Tull, "Incorporation of the world views of Indigenous cultures: a dilemma in the practice and teaching of Western science", *Proceedings of the Third International History, Philosophy, and Science Teaching Conference* (Minneapolis, Minnesota, 1995), p. 2, available at http://eric.ed.gov/?id=ED391693.

41 Jing Li and Feng Han, "Strong ethics and flexible actions, the properties of traditional ecological knowledge (TEK), as key resources for socioecological resilience to the impacts of climate change: a case study of Baojiatun, Yunnan-Guizhou Plateau karst area, southwest China", *Ecology and Society,* vol. 27, No. 4, art. 31 (2022), p. 31, available at https://doi.org/10.5751/ES-13400-270431.

42 Miye Nadya Tom, Elizabeth Sumida Huaman and Teresa L. McCarty, "Indigenous knowledges as vital contributions to sustainability", *International Review of Education,* vol. 65, No. 1 (2019), pp. 1-18, available at https://doi.org/10.1007/s11159-019-09770-9.

43 Luisa Maffi and Ellen Woodley, *Biocultural Diversity Conservation: A Global Sourcebook* (London, Earthscan, 2010).

44 A more precise estimate of 476 million is provided in United Nations, "International Day of the World's Indigenous Peoples: 9 August", observances page, 9 August 2024, available at https://www.un.org/en/observances/indigenous-day.

45 Teresa L. McCarty and Serafín M. Coronel-Molina, "Language education planning and policy by and for Indigenous peoples", in *Language Policy and Political Issues in Education*, Teresa L. McCarty and Stephen May, eds. (Cham, Switzerland, Springer International, 2017), pp. 155-170.

46 Chiblow and Meighan, "Language is land, land is language: the importance of Indigenous languages".

47 Jenane Ferguson and Marissa Weaselboy, "Indigenous sustainable relations: considering land in language and language in land", *Current Opinion in Environmental Sustainability*, vol. 43 (April 2020), pp. 1-7, available at https://doi.org/10.1016/j.cosust.2019.11.006.

48 Pamela Rose Toulouse, *Truth and Reconciliation in Canadian Schools* (Winnipeg, Manitoba, Canada, Portage and Main Press, 2018).

49 Wilma Mankiller, "Being Indigenous in the 21st century", article, 9 June 2010, *Cultural Survival Quarterly Magazine* (Cambridge, Massachusetts, Cultural Survival), available at www.culturalsurvival.org/publications/cultural-survival-quarterly/being-indigenous-21st-century.

50 Ladislaus M. Semali and Joe L. Kincheloe, eds., *What is Indigenous Knowledge? Voices from the Academy* (New York, Falmer Press, 1999).

racisms and injustices. Dominant Western thinking, with its anthropocentric worldview, is incompatible with Indigenous worldviews and lifeways rooted in the principle of reciprocity and strong, dynamic relationships between communities, humans, more than humans, and the local environment.[51]

Indigenous languages are vital for Indigenous Peoples, as they transmit lifeways to future Indigenous inheritors and practitioners. These lifeways enable a relational stewardship of the local environment and an understanding of one's own heritage, responsibilities, and identity.[52] Indigenous languages convey scientific and technical knowledge about local lands, waters, and ecosystems,[53],[54],[55] and they have developed organically in ways that allow Indigenous Peoples to communicate linguistically unique medicinal knowledge and other concepts deeply embedded in specific cultural contexts.[56] A natural sciences study carried out by Rodrigo Cámara Leret and Jordi Bascompte corroborates the relationship between Indigenous languages and Indigenous knowledge, with their analysis indicating that "threatened [Indigenous] languages support 86% and 100% of all unique [medicinal] knowledge in North America and northwest Amazonia, respectively".[57]

1.2.2 Indigenous cultures: context

Indigenous Peoples live in many different parts of the world. They are distinct from mainstream communities and from each other, but they all share collective ancestral ties to the lands in which they live or from which they have been displaced. The lands are inextricably linked to their identities, providing them with their language, culture, laws, system of governance, and scientific and technical knowledge. Because such knowledge is deeply rooted in and intertwined with culture, it is based on more than the collection of data; it stems from a holistic, relational worldview that emphasizes community values and ecocentric practices, including kinship, reciprocity, and relationships with the land, animals, spirits, and fellow humans.[58],[59] It cannot be stressed enough that Indigenous cultures, languages, governance and laws are inseparable from Indigenous People and each other. Each distinct Indigenous culture has protocols on how to access its scientific and technical knowledge and determines who is an Indigenous science practitioner. When non-Indigenous peoples engage with scientific and technical knowledge that is specific to a particular Indigenous culture, knowledge system, community, or Nation, they must adhere to the principle of free, prior, and informed consent, whereby Indigenous Peoples decide whether to share or not share such knowledge.

1.2.3 Intellectual property rights and free, prior and informed consent

The term "intellectual property" is used to refer to "creations of the mind, such as inventions, literary and artistic works, designs, and symbols, names and images used in commerce".[60] Writing about the situation of Indigenous Peoples' communities in Zimbabwe, Constance Nhambura remarks that "Indigenous resources are disappearing at an alarming rate due to exploitation by non-indigenous people. … The sustainability of Indigenous resources is being compromised by a lack of intellectual property rights … [that would allow Indigenous Peoples] to own and

51 Mario Blaser, Harvey A. Feit and Glenn McRae, eds., *In the Way of Development: Indigenous Peoples, Life Projects and Globalization* (London and New York, Zed Books, 2004).
52 Basil Johnston, *Th!nk Indian: Languages Are Beyond Price* (Ontario, Canada, Kegedonce Press, 2011).
53 Kathleen E. Absolon, *Kaandossiwin: How We Come to Know* (Nova Scotia, Canada, Fernwood Publishing, 2011).
54 Wendy Makoons Geniusz, *Our Knowledge Is Not Primitive: Decolonizing Botanical Anishinaabe Teachings*,1st ed. (Syracuse, New York, Syracuse University Press, 2009).
55 Susan Chiblow and Paul J. Meighan, "Anishinabek Giikendaaswin and Dùthchas nan Gàidheal: concepts to (re)center place-based knowledges, governance, and land in times of crisis", *Ethnicities*, vol. 24, No. 4 (2023), available at https://doi.org/10.1177/14687968231219022.
56 Rodrigo Cámara-Leret and Jordi Bascompte, "Language extinction triggers the loss of unique medicinal knowledge", *Proceedings of the National Academy of Sciences*, vol. 118, No. 24 (2021), e2103683118, available at https://doi.org/10.1073/pnas.2103683118.
57 Ibid., p. 1.
58 Ronald Eric Ignace and Mary Jane Jim, *Towards a New Beginning: A Foundational Report for a Strategy to Revitalize First Nation, Inuit and Métis Languages and Cultures – Report to the Minister of Canadian Heritage* (Ottawa, Canada, Task Force on Aboriginal Languages and Cultures, 2005), pp. 21-33, available at https://publications.gc.ca/site/eng/9.852166/publication.html.
59 Shaun Wilson, "What is an Indigenous research methodology?" *Canadian Journal of Native Education*, vol. 25, No. 2 (2001), pp. 175-179.
60 World Intellectual Property Organization, "What is intellectual property?", available at https://www.wipo.int/about-ip/en/#:~:text=Intellectual%20property%20(IP)%20refers%20to,and%20images%20used%20in%20commerce.

protect their resources".[61] One particular challenge is that identifying the "originators" of knowledge within Indigenous contexts can be problematic – and this can make it very difficult to protect Indigenous knowledge and cultural resources under international law. In a 2023 article, Ulia Gosart and Wend Wendland offer the following observations:

> Indigenous intellectual property rights, broadly, is a term used to describe rights which Indigenous Peoples seek to adequately protect their intellectual and cultural heritage. Given that elements of this heritage are often communal in nature and inter-generational, their protection could be difficult, even impossible, by the intellectual property (IP) laws of the States where Indigenous Peoples are located. For example, copyright laws protect "original" works by identifiable individuals. This means that a traditional cultural expression of a community preserved from one generation to the next may be relegated to the so-called "public domain" and be open to misuse and misappropriation. Given this situation, members of Indigenous Peoples seek alternative ways to protect their intellectual and cultural materials. Primarily, they look for ways to employ customary laws and protocols as guiding norms of knowledge protection.[62]

Classifying Indigenous languages, cultures, and scientific and technical knowledge as Indigenous intellectual property is vital, as this provides Indigenous Peoples with the means to ensure their protection and preservation. Indigenous Peoples' communities have been responsible for safeguarding and maintaining their languages, cultures, and scientific and technical knowledge for thousands of years. In the wider global context, with Indigenous intellectual resources threatened by outside forces, the need to develop special measures to protect Indigenous languages, cultures, and scientific and technical knowledge has been recognized by the United Nations and Indigenous organizations worldwide. Article 31 of the United Nations Declaration on the Rights of Indigenous Peoples states the following:

> Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.[63]

To prevent further exploitation of Indigenous Peoples' languages, cultures, and scientific and technical knowledge, the principle of free, prior and informed consent must be activated. The Declaration includes multiple references to this principle, emphasizing "the importance of recognizing and upholding the rights of Indigenous peoples and ensuring that there is effective and meaningful participation of Indigenous Peoples in decisions that affect them, their communities, and territories",[64] in line with their universal right to self-determination. Free, prior and informed consent allows Indigenous Peoples to provide or withdraw consent at any point for projects or other activities impacting their territories. It also allows them to engage in negotiations on the design, implementation, monitoring, and evaluation of initiatives.

In Canada, information about Indigenous Peoples' right to protect their intellectual property, including their knowledge and cultural resources, is available in the Indigenous languages of Inuktitut, Plains Cree, Ojibwe, Michif, and Mi'kmaq.[65] In 2017, the World Intellectual Property Organization released a guide on the importance

61 Constance Nhambura, "Indigenous People and the protection of intellectual property rights (IPRs) in Zimbabwe", in *Indigenous and Minority Populations – Perspectives from Scholars and Writers across the World* (2023), available at https://www.intechopen.com/chapters/87100.
62 Ulia Gosart and Wend Wendland, "Indigenous intellectual property rights: an interview with Wend Wendland", *The Serials Librarian*, vol. 84, No. 5-8 (2023), available at https://www.tandfonline.com/doi/full/10.1080/0361526X.2023.2235758.
63 United Nations, United Nations Declaration on the Rights of Indigenous Peoples (2007), available at https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf.
64 Canada, Department of Justice, United Nations Declaration on the Rights of Indigenous Peoples Act (2021), available at https://www.justice.gc.ca/eng/declaration/about-apropos.pdf.
65 Canada, "Indigenous Peoples and intellectual property" (2023), available at https://ised-isde.canada.ca/site/intellectual-property-strategy/en/indigenous-peoples-and-intellectual-property.

Inuit Indigenous women of Uummannaq, Greenland. UN Photo/Mark Garten

of safeguarding intellectual property and how Indigenous Peoples can protect and promote their cultures.[66] A 2020 journal article by Stephanie Russo Carroll and others outlines a set of principles designed to guide stewards and users of Indigenous data:

> The International Indigenous Data Sovereignty Interest Group (within the Research Data Alliance), a network of nation-State-based Indigenous data sovereignty networks and individuals, developed the 'CARE Principles for Indigenous Data Governance' (Collective Benefit, Authority to Control, Responsibility, and Ethics) in consultation with Indigenous Peoples, scholars, non-profit organizations, and Governments. The CARE Principles are people- and purpose-oriented, reflecting the crucial role of data in advancing innovation, governance, and self-determination among Indigenous Peoples. … The CARE Principles build upon earlier work by the Te Mana Raraunga Maori Data Sovereignty Network, US Indigenous Data Sovereignty Network, Maiam nayri Wingara Aboriginal and Torres Strait Islander Data Sovereignty Collective, and numerous Indigenous Peoples, Nations, and communities.[67]

66 World Intellectual Property Organization, *Protect and Promote Your Culture: A Practical Guide to Intellectual Property for Indigenous Peoples and Local Communities* (2017), available at https://www.wipo.int/publications/en/details.jsp?id=4195.

67 Stephanie Russo Carroll and others, "The CARE Principles for Indigenous Data Governance", *Data Science Journal*, vol. 19, No. 1 (2020), p. 43, available at https://doi.org/10.5334/dsj-2020-043.

1.2.4 Case studies

Indigenous Peoples' cultures, values, and scientific and technical knowledge are embedded in, encoded in, and transmitted through Indigenous languages. Benjamin Wilder and others relate that the Comcaac (Seri people) of Sonora, Mexico, use the terms *Moosni Oofia* (what the green sea turtles encircle) to describe a shoal in the ocean and *Tosni Iti Ihiiquet* (where the pelicans have their offspring) as a name for Rasa Island.[68] Elizabeth Sumida Huaman[69] describes how *yachayninchis* (our knowledge) provides values and guidance for living in the Peruvian Andes. Brent DeBassige[70] describes how the Anishinaabe concept *mino-bimaadiziwin* (the good life) emphasizes a spirit-centred path to knowledge and integrates the "past, present, and future of Good and respectful approaches to life". In the Gaelic context of the Highlands and Islands of Scotland, the concept *Dùthchas*, derived from the word *dú/dùth* (earth or land), stresses the importance of ecological balance among all inhabitants and entities, human and more than human.[71]

Indigenous scientific and technical knowledge is also integrated at the community and ecosystem levels. Among the Anishinaabe, the health of the ecosystem has been preserved through practising and living *giikendaaswin* (learning from the lands, waters and sky world – acquiring a "lived knowledge").[72] In 2009, Priscilla Wehi analysed Māori ancestral sayings that describe the pollination of *harakeke* (New Zealand flax – *Phormium tenax*) by native kākā parrots (*Nestor meridionalis*).[73] A recent study carried out by Cámara-Leret and Bascompte found that in three regions with high biocultural diversity in Northern America, north-western Amazonia, and New Guinea, "over 75% of all 12,495 medicinal plant services are linguistically unique – i.e., known to only one [Indigenous] language".[74]

Indigenous scientific and technical knowledge, encoded in and transmitted through Indigenous languages, offers unique contributions to humanity and biodiversity. This knowledge is "not a description of reality but an understanding of the processes of ecological change and ever-changing insights about diverse patterns or styles of flux".[75]

1.2.5 Interconnectivity and indivisibility

Frances Owusu-Ansah and Gubela Mji, citing information from Peter Sarpong, explain that a "worldview shapes consciousness and forms the [philosophical and] theoretical framework within which knowledge is sought, critiqued and/or understood".[76] They share insights from Molefe Kete Asante, contending that "almost all knowledge has cultural relevance and must be examined for its particular focus. From this perspective, it is dangerous, if not oppressive, to hail any one method of investigation as universal".[77] They also convey Asante's assertion that "the hallowed concepts and methods within Western thought are inadequate to explain all of the ways of knowing because 'universality can only be dreamed about when we have "slept" on truth based on specific cultural experiences'. … All cultures and the Indigenous ways of knowing arising from them are to be respected and valued in their uniqueness".[78] In essence, all knowledge systems are interconnected in a pluriversal (rather than universal) view of the world. It is

68 Benjamin T. Wilder and others, "The importance of Indigenous knowledge in curbing the loss of language and biodiversity", *BioScience,* vol. 66, No. 1 (June 2016), pp. 499-509, available at https://doi.org/10.1093/biosci/biw026.

69 Elizabeth Sumida Huaman, "Yachayninchis (our knowledge): environment, cultural practices, and human rights education in the Peruvian Andes", in *Handbook of Indigenous Education*, Elizabeth Ann McKinley and Linda Tuhiwai Smith, eds. (Singapore, Springer, 2019), pp. 725-765, available at https://doi.org/10.1007/978-981-10-3899-0_3.

70 Brent DeBassige, "Re-conceptualizing Anishinaabe mino-bimaadiziwin (the good life) as research methodology: a spirit-centered way in Anishinaabe research", *Canadian Journal of Native Education*, vol. 33, No. 1 (January 2010), pp. 11-28.

71 Chiblow and Meighan, "Language is land, land is language: the importance of Indigenous languages".

72 Chiblow and Meighan, "Anishinaabek Giikendaaswin and Dùthchas nan Gàidheal: concepts to (re)center place-based knowledges, governance, and land in times of crisis".

73 Priscilla M. Wehi, "Indigenous ancestral sayings contribute to modern conservation partnerships: examples using Phormium tenax", *Ecological Applications*, vol. 19, No. 1 (2009), pp. 267-275, available at https://dx.doi.org/10.6084/m9.figshare.c.3294161.

74 Cámara-Leret and Bascompte, "Language extinction triggers the loss of unique medicinal knowledge".

75 James Sakej Youngblood Henderson, "Postcolonial ledger drawing: legal reform", in *Reclaiming Indigenous Voice and Vision*, Marie Battiste, ed. (Vancouver, UBC Press, 2000), pp. 161-172.

76 Frances E. Owusu-Ansah and Gubela Mji, "African indigenous knowledge and research", *African Journal of Disability*, vol. 2, No. 1 (2013), citing information from Peter Kwasi Sarpong, *Peoples Differ: An Approach to Inculturation in Evangelization* (Legon, Accra, Ghana, Sub-Saharan Publishers, 2002).

77 Frances E. Owusu-Ansah and Gubela Mji, "African indigenous knowledge and research", African Journal of Disability, vol. 2, No. 1 (2013), citing information from Molefe Kete Asante, *The Afrocentric Idea* (Philadelphia, Temple University Press, 1987).

78 Ibid., p. 168.

possible for different peoples to learn from one another through "trans-systemic knowledge exchanges".[79] This would involve a (re)centring of Indigenous languages, cultures, and scientific and technical knowledge in mainstream society to inform legislative and policy decision-making relating to climate change and other global challenges.

For Indigenous Peoples, Nations, and communities across the globe, language is not separate from culture, from the lands and waters, or from scientific and technical knowledge;[80] a threat to one of these is a threat to all. It therefore follows that if Indigenous knowledge is to be utilized to serve global interests, nation-State Governments must fully support and fund Indigenous-led programmes for the preservation and revitalization of Indigenous Peoples' languages. This imperative is reflected in the priorities surrounding the International Decade of Indigenous Languages (2022-2032). Having official safeguards in place to protect Indigenous Peoples' languages, cultures, and scientific and technical knowledge will help ensure that Indigenous climate change and other relevant environmental research, information, records, practices and policies can be appropriately documented and translated.

1.3. The significance of Indigenous Peoples' languages, cultures, and scientific and technical knowledge in the context of climate change

1.3.1 The world without

Western science is arguably the most dominant science in the world today and is widely considered the officially sanctioned science. However, it has been implicated in prejudicial and detrimental research and practices[81] and has precipitated much of the world's environmental degradation and ecological destruction, including pesticide contamination, introduced species, extraction activities, and water diversions that have harmed Indigenous lifeways and ecosystems.[82]

In contrast to Western science, which tends to be reductionist, hierarchical, and dependent on categorization and to revolve around a universal set of explanations, Indigenous science and scientific and technical knowledge are place-specific and contextual. Exclusive reliance on Western science to combat climate change and mitigate its impact can be problematic and even counterproductive. The destruction of ecosystems, habitats, and the biosphere under the Western motif of economic growth and progress continues to threaten the ecological heritage and harmony of Indigenous value, belief, governance, and knowledge systems.[83] It also jeopardizes the generative capacity of appropriate, place-based responses to human-caused climate change.

Indigenous languages are important not only to Indigenous Peoples but to humanity as a whole. Threats to Indigenous languages, cultures, knowledges (including scientific and technical knowledge), and collective

79 Marie Battiste, *Decolonizing Education: Nourishing the Learning Spirit* (Saskatoon, Saskatchewan, Canada, Purich Publishing Limited, 2013).
80 Ferguson and Weaselboy, "Indigenous sustainable relations: considering land in language and language in land".
81 Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples*, 3rd ed. (New York, Zed Books, Bloomsbury Publishing, 2021).
82 Val Plumwood, *Environmental Culture: The Ecological Crisis of Reason* (London, Routledge, 2022).
83 Nicolas Houde, "The six faces of traditional ecological knowledge: challenges and opportunities for Canadian co-management arrangements", *Ecology and Society*, vol. 12, No. 2 (2007), p. 34, available at http://www.ecologyandsociety.org/vol12/iss2/art34/.

rights (including self-determined land governance and treaty rights) endanger collective local ecosystems and the ability of Indigenous Peoples to respond to climate change.[84],[85] Highly specialized, place-specific environmental knowledge encoded in and transmitted through Indigenous languages is jeopardized or lost when an Indigenous language community shifts – by force, coercive policy, or necessity – to using a dominant colonial language such as English.

1.3.2 Case studies highlighting the importance of Indigenous scientific and technical knowledge

Indigenous scientific and technical knowledge has been used in connection with climate change in multiple ways. It has been leveraged for the development of mitigation strategies, the identification and measurement of multiple ecosystem indicators, baseline studies, species identification, habitat assessments (including analyses of habitat loss), and the monitoring of species population trends. Such knowledge has been used to develop predictive models for identifying climate change adaptation options and vulnerabilities, including potential impacts on traditional livelihoods and subsequent health implications.[86] Indigenous scientific and technical knowledge can be and has been used with Western scientific knowledge to strengthen risk assessments, enabling individuals to make informed decisions about weather-related risks and hazards associated with traditional harvesting and land-use activities[87] and facilitating the planning and location of future infrastructure.[88]

Indigenous scientific and technical knowledge has contributed enormously to the global body of knowledge on the environment and its complex dynamics. Gilton Mendes dos Santos and Yasmine Antonini,[89] researching Enawene-Nawe knowledge of stingless bees in the western Brazil, found that Indigenous knowledge holders could differentiate between 48 different species and identify the ecological niche of each one. In a journal article on biological variation, Jean Polfus and others[90] illustrated how the Sahtú Dene and Métis peoples of northern Canada differentiated between boreal, mountain, and barren-ground caribou; genetic analyses demonstrated that the distinct caribou subpopulation structure aligned with the original Dene classifications. The Kichwa Sarayaku people of Ecuador have prepared a proposal known as *Kawsay Sacha* (Living Forest) "to protect the forests and keep fossil fuels in the ground based on the life-plans developed within their own community".[91] Rotational agriculture systems informed by traditional knowledge are still in use among the Igorot of the Philippines; the Karen of China, Myanmar and Thailand; and the Achiks of India. This practice increases the overall health of forest and jungle ecosystems, which is critical for the mitigation of the adverse effects of global warming.[92] The Barisal and Pirojpur in Bangladesh rely on a traditional method of hydroponic cultivation known as *dhp*, or *baira*, which represents the intersection of agricultural biodiversity, resilient ecosystems, and cultural heritage.[93] Indigenous women are important developers and custodians of scientific and technical knowledge but are often excluded from scientific discourse. As a result of this exclusion, there are aspects of environmental knowledge about which relatively little is known. The

84 Kyle P. Whyte, "Indigenous climate change studies: Indigenizing futures, decolonizing the Anthropocene", *English Language Notes*, vol. 55, No. 1-2 (2017), pp. 153-162, available at https://kylewhyte.marcom.cal.msu.edu/wp-content/uploads/sites/12/2018/07/IndigenousClimateChangeStudies.pdf.

85 Stephen T. Garnett and others, "A spatial overview of the global importance of Indigenous lands for conservation", *Nature Sustainability*, vol. 1, No. 7 (July 2018), pp. 369-374, available at https://doi:10.1038/s41893-018-0100-6.

86 Nancy J. Turner and Pamela Spalding, "Learning from the earth, learning from each other: ethnoecology, responsibility and reciprocity", in *Resurgence and Reconciliation: Indigenous-Settler Relations and Earth Teachings*, Michael Asch, John Borrows and James Tully, eds. (Toronto, Ontario, University of Toronto Press, 2018), pp. 265-292.

87 Riedlinger and Berkes, "Contributions of traditional knowledge to understanding climate change in the Canadian Arctic".

88 Ella Belfer and others, "Pursuing an Indigenous platform: exploring opportunities and constraints for Indigenous participation in the UNFCCC", *Global Environmental Politics*, vol. 19, No. 3 (January 2019), pp. 12-33, available at https://doi:10.1162/glep_a_00489.

89 Gilton Medes dos Santos and Yasmine Antonini, "The traditional knowledge on stingless bees (Apidae: Meliponina) used by the Enawene-Nawe tribe in western Brazil", *Journal of Ethnobiology and Ethnomedicine*, vol. 4, No. 1 (2008), p. 19, available at https://pubmed.ncbi.nlm.nih.gov/18793393/.

90 Jean L. Polfus and others, "Łeghágots'enetę (learning together): the importance of indigenous perspectives in the identification of biological variation", *Ecology and Society*, vol. 21, No. 2 (2016), p. 18, available at http://dx.doi.org/10.5751/ES-08284-210218.

91 Mirian Masaquiza Jerez, "Challenges and opportunities for Indigenous Peoples' sustainability", Policy Brief, No. 101 (New York, United Nations, Department of Economic and Social Affairs, April 2021), available at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_101.pdf.

92 Ibid.

93 Ibid.

International Council for Research in Agroforestry found, for example that there are knowledge gaps in areas such as soil management in the Machakos District in Kenya.[94] The foundational values and lessons learned from Indigenous scientific and technical knowledge can be used to promote broader environmental stewardship and effective approaches to preserving biodiversity. These are priorities for both Indigenous and non-Indigenous communities at the national and global levels.

1.3.3 Combining Indigenous and Western scientific and technical knowledge to protect the environment

Indigenous languages, cultures, and scientific and technical knowledge contribute to maintaining global ecological balance and resilience and are therefore vital for the preservation of humanity. Because they are centred around environmental preservation, they play a crucial role in sustainable development and are ideally suited to addressing urgent global challenges such as climate change.

Many Indigenous land and environmental management practices have been proven to enhance and promote biodiversity at the local level and aid in maintaining healthy ecosystems.[95] These practices reflect time-tested, in-depth, highly specialized knowledge of local areas (past and present). Indigenous scientific and technical knowledge can complement Western science in providing more accurate environmental assessment and impact statements[96] and in validating the need for ethical behaviour with respect to more than humans and the environment.[97] Such cooperation is supported by the 2030 Agenda for Sustainable Development, which calls for partnerships to achieve the Sustainable Development Goals for people, planet and prosperity.

1.4. Conclusions and recommendations

Indigenous Peoples have always had to respond to climate changes, and their scientific and technical knowledge has continuously evolved to ensure their collective survival. This has required a deep, enduring understanding of the dynamic connections between humans and the environment that cannot be divorced from Indigenous histories, cultures, languages and worldviews.

Human-driven climate change has reached a critical state, and all the world's knowledge systems, sciences, and technologies must be galvanized to identify solutions. Indigenous Peoples have been demanding a place at decision-making tables so they can introduce their scientific and technical knowledge into deliberations and contribute to climate change mitigation efforts. They need to be included in any and all discussions, as Indigenous Peoples are driven by their responsibility and knowledge of how best to protect their lands and waters. With dominant Western knowledge, science, and technology largely driving the climate change discourse, many Governments, institutions, and individuals are uncertain about what kind of role Indigenous scientific and technical knowledge can play in the climate change arena. The recommendations below, while not exhaustive, offer a foundation for ensuring that Indigenous Peoples' scientific and technical knowledge is meaningfully and tangibly included in legislative, policy, and other decision-making processes.

1.4.1 The rights of Indigenous Peoples to safeguard their languages, cultures, and scientific and technical knowledge and to protect the planet

Climate change has been exacerbated by historical and contemporary practices linked to colonialism and capitalism, which have led to the dispossession of

94 Ibid.
95 United Nations Permanent Forum on Indigenous Peoples, "Backgrounder – traditional knowledge", available at https://social.desa.un.org/sites/default/files/migrated/19/2019/04/Traditional-Knowledge-backgrounder-FINAL.pdf.
96 Houde, "The six faces of traditional ecological knowledge: challenges and opportunities for Canadian co-management arrangements".
97 Nancy Turner and Pamela R. Spalding, "'We might go back to this'; drawing on the past to meet the future in northwestern North American Indigenous communities", *Ecology and Society*, vol. 18, No. 4 (2013), p. 29, available at http://dx.doi.org/10.5751/ES-05981-180429.

Indigenous Peoples and the disruption of culturally significant multi-species relationships.[98],[99] Indigenous Peoples, through long experience, have gained a deep understanding of sustainability, maintaining "exemplary ethical communities" that understand the vital importance of taking only what is needed.[100] They have persevered and endured for millennia because of their profound relationship with their environment. It is time to protect, reinforce and leverage this relationship so that the ecological balance can be restored. At the twenty-sixth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 26), Brazilian Indigenous activist Taily Terena opened the Indigenous Peoples Pavilion with these words: "Colonialism caused climate change. Our rights and traditional knowledge are the solution."

It is recommended that action be taken to affirm the right of Indigenous Peoples to protect the natural world; this is inextricably linked to the protection of thousands of years of Indigenous languages, cultures, and scientific and technical knowledge.

The United Nations has produced a number of reports with recommendations relating to Indigenous Peoples and their scientific and technical knowledge. A 2021 policy brief on challenges and opportunities for Indigenous Peoples' sustainability identifies the United Nations Declaration on the Rights of Indigenous Peoples as a key framework for planning and implementing programmes relating to climate change mitigation and adaptation and climate finance and calls for efforts to ensure the full participation of Indigenous Peoples, including Indigenous women, in the formulation of such programmes at all levels.[101] The IPCC Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change incorporates hundreds of recommendations relating to the input of Indigenous Peoples, noting that their "participation … in climate change decisions and the inclusion of Indigenous knowledge in the IPCC assessment process should be of high priority".[102]

1.4.2 Indigenous Peoples' self-determination, self-governance, and inclusion as full partners in legislative and policy decision-making

Indigenous Peoples' communities and Nations – largely represented by their own advocacy organizations – must be full and equal partners in policy decision-making processes. If Indigenous Peoples take their place at the table in all climate change policy discussions, negotiations, and decisions, there will be no need to protect their scientific and technical knowledge because they will choose what to share, when to share, and with whom to share in line with the principle of free, prior and informed consent.

Climate policy can be made more just and effective through the full and meaningful inclusion of Indigenous Peoples in decision-making and the protection of their rights, knowledge, and sovereignty. Addressing climate change will require the dismantling of colonial relations and structures in all nation-States. A broad relinquishment of power by settler colonial structures and systems is needed to ensure the meaningful co-creation of climate policy that is rooted in Indigenous self-determination. The following is recommended to strengthen the role of Indigenous Peoples in legislative and policy decision-making:

98 Whyte, "Indigenous science (fiction) for the Anthropocene: ancestral dystopias and fantasies of climate change crises".
99 Intergovernmental Panel on Climate Change, "Climate change 2022: impacts, adaptations and vulnerability", access to contributions to the PICC Sixth Assessment Report, available at https://www.ipcc.ch/report/ar6/wg2/.
100 Conversi, "Exemplary ethical communities: a new concept for a livable Anthropocene".
101 Masaquiza Jerez, "Challenges and opportunities for Indigenous Peoples' sustainability".
102 Following recommendations in UNESCO, *World Heritage for Sustainable Development in Africa*, Edmond Moukala and Odiaua Ishanlosen, eds. (Paris, 2018); United Nations System Chief Executives Board for Coordination, "Building an inclusive, sustainable and resilient future with indigenous peoples: a call to action" (New York, 2020). Quote taken from Intergovernmental Panel on Climate Change, *Climate Change 2022: Impacts, Adaptation and Vulnerability – Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Hans-Otto Pörtner and others, eds. (Cambridge, United Kingdom, and New York, Cambridge University Press, 2022), p. 155, available at https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf. See https://www.ipcc.ch/assessment-report/ar6/ for all the IPCC reports on climate change.

- Promoting leadership by Indigenous women and individuals identifying as 2SLGBTQIA+;[103]
- Incorporating Indigenous Peoples' rights to self-determination and the principle of free, prior and informed consent in the process of developing policy and in the content of policies and plans;
- Formalizing federal commitments to strengthen relationships between different Indigenous Peoples or Nations, between Indigenous Peoples and Governments, and between State Governments;
- Activating calls to action emanating from inquiries led by government entities such as truth and reconciliation commissions;
- Pursuing climate solutions that take into account the realities faced by Indigenous Peoples' communities and Nations in both rural and urban settings;
- Ensuring that any climate action does not have a disproportionately negative impact on Indigenous Peoples and their communities;
- Actively addressing persistent structural inequalities emanating from colonial processes and structures;
- Addressing the root causes of human-driven climate change, including colonial and extractive capitalism;
- Nation-States providing Indigenous Peoples with increased access to direct funding for climate change mitigation and adaptation;
- Coming to a shared understanding of climate processes and challenges to facilitate the design of intersectional climate solutions;
- Shifting authority from settler colonial structures and systems towards increased autonomy among Indigenous Peoples' communities to level the playing field and ensure the meaningful co-creation of climate policy and legislation rooted in Indigenous rights to self-determination and the principle of free, prior and informed consent.

1.4.3 The meaningful participation of Indigenous women in the climate discourse

It is vitally important to ensure the meaningful participation of Indigenous women in climate change discussions and decisions, as their knowledge differs from that of men. The knowledge of Indigenous women is unique to their relationship with their lands; collectively, Indigenous women possess deep wells of specialized knowledge that can be tapped and leveraged for a transformative transition to sustainable climate change solutions.[104] Indigenous women are among the strongest activists engaged in efforts to protect Indigenous lands, territories and resources. In Peru, for example, subsistence farmer Máxima Acuña has successfully challenged Buenaventura and the Newmont Corporation (major gold producers), defending her right to remain on her own property in Indigenous territory located in Tragadero Grande, Cajamarca.

Indigenous women should receive sufficient direct funding to ensure their participation in all climate change activities. They should be provided with substantial financial and technical assistance to nurture and further develop their scientific and technical knowledge so that they can participate meaningfully in the development of both global and localized climate change mitigation and adaptation measures. This knowledge-building should include training workshops provided by and for Indigenous Peoples.[105]

103 "This acronym represents Two-Spirit, lesbian, gay, bisexual, transgender, queer, intersex, and additional people who identify as part of sexual and gender diverse communities. The '2S' at the front recognizes Two-Spirit people as the first 2SLGBTQI+ communities." (Canada, "What is 2SLGBTQI+?", available at https://www.canada.ca/en/women-gender-equality/free-to-be-me/what-is-2slgbtqi-plus.html.)

104 Susan Chiblow, "Relationships and responsibilities between Anishinaabek and Nokomis Giizis (Grandmother Moon) inform N'bi (Water) governance", *AlterNative: An International Journal of Indigenous Peoples*, vol. 19, No. 2 (2023), pp. 1-10, available at https://doi.org/10.1177/11771801231173114.

105 United Nations, Permanent Forum on Indigenous Issues, "Impact of climate change mitigation measures on Indigenous Peoples and their territories and lands", 19 March 2008 (E/C.19/2008/10), submitted by Victoria Tauli-Corpuz and Aqqaluk Lynge, available at https://www.un.org/esa/socdev/unpfii/documents/E_C19_2008_10.pdf.

1.4.4 Centring – not integrating – Indigenous Peoples' languages, cultures, and scientific and technical knowledge in the development of climate solutions

Colonization and colonial practices pose an enormous threat to global biodiversity and all of humanity. A significant portion of the world's population has contributed to harming the environment, and everyone in the world has felt its impact. Climate change and other effects of environmental degradation are problems that endanger the entire planet, and it is vital that humanity come together, identifying and utilizing the best available resources to explore solutions that are equitable and sustainable. In Canada, the ideal of reciprocity is conveyed in the calls to action by the Truth and Reconciliation Commission, as it is recognized that those living throughout the Canadian provinces "are all Treaty people". There is a need for "ethical relationality", which is essentially "'an ecological understanding of human relationality that does not deny difference, but rather seeks to understand more deeply how our different histories and experiences position us in relation to each other".[106] From this perspective, reciprocity is not about incorporating Indigenous languages, cultures, and scientific and technical knowledge into the dominant Western scientific and knowledge framework, but rather about creating a more level exchange among diverse knowledge systems to better address climate change and other urgent challenges the world is presently facing. While everyone and everything is impacted by climate change, not everyone or everything is impacted the same; Indigenous populations are among the most seriously affected. Indigenous Peoples – through their languages, cultures, and scientific and technical knowledge – offer time-tested strategies and remedies. As highlighted in a 2021 report released by Indigenous Climate Action on decolonizing climate policy in Canada, "to effectively address climate change, policies and solutions need to take aim at the ongoing drivers and root causes of the crisis and should center the voices, needs and leadership of the people most impacted by the crisis".[107]

1.4.5 Indigenous-led initiatives and programmes aimed at preserving and leveraging Indigenous languages, cultures, and scientific and technical knowledge

There must be broader recognition of the importance of Indigenous scientific and technical knowledge in combating climate change. Indigenous Peoples must be proactive in securing such recognition, leading the conception, design, and implementation of programmes and initiatives aimed at strengthening and preserving Indigenous languages, cultures, and scientific and technical knowledge and ensuring their wider dissemination. When nation-States discuss climate change solutions, Indigenous Peoples need to be fully involved to ensure that responses are place-based and appropriate, draw directly from Indigenous scientific and technical knowledge, and align with the principles of free, prior and informed consent. Steps must be taken to ensure that climate change research is undertaken by and for Indigenous Peoples at the local level. Networking on climate change among Indigenous academics, scientists, and other knowledge-holders must be better supported to facilitate the dissemination of climate change research, information, and documentation among Indigenous Peoples and outside Indigenous communities.

Indigenous-led programmes for the revitalization of Indigenous languages need to be supported. Climate change research, information, policies, and documentation must be translated into Indigenous languages. Educational programmes relating to Indigenous scientific and technical knowledge should be undertaken by and for Indigenous Peoples to support centres dedicated to activating this knowledge for climate change studies and solutions. Ideally, steps should be taken to create an international Indigenous foundation focused on such work. This institution could adopt a relational epistemological framework that would include (but not be limited to) the following:

- Humans are part of the natural world, not above it.
- Everything in the world is interconnected.

106 Dwayne Trevor Donald, "Forts, curriculum, and Indigenous Métissage: imagining decolonization of Aboriginal-Canadian relations in educational contexts", *First Nations Perspectives,* vol. 2, No. 1 (2009), pp. 1-24.

107 Indigenous Climate Action, *Decolonizing Climate Policy in Canada: Report from Phase One* (March 2021), p. 5, available at https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf.

Sun Dancers - Inti Raymi, Kichwa Salasaka, Ecuador. Credit: Luis Daniel Masaquiza

- Ecosystems support the existence of humankind.
- Multiple perspectives – including interspecies perspectives – must be adopted.
- All of nature has the right to survive and thrive.
- The focus must be on whole systems.
- All the world is alive with responsibilities; the earth is a gift.

1.4.6 Territorial language principle for the maintenance, reclamation, revitalization, and protection of Indigenous languages

A territorial language principle – which "grants language rights that are limited to a particular territory in order to ensure the maintenance of a particular language in that area"[108] – needs to be established to support the reclamation, revitalization, conservation, and protection of Indigenous languages, especially in nation-States where more than one Indigenous language is spoken. This would align with the principle of free, prior and informed consent and could have implications for the implementation of the United Nations Declaration on the Rights of Indigenous Peoples[109] in nation-States across the world. As noted by Jackie Hartley, Paul Joffe, and Jennifer Preston, the Declaration can be used "to advocate for a new approach to policy development – one that reflects the indivisibility and interconnectedness of human rights – leading to better outcomes for Indigenous people, including women and children".[110]

1.4.7 A paradigm shift in research, policy, and education

The Indigenous perspective is that people are guests or visitors in the lands where they reside; they are there temporarily and must safeguard natural resources for the use of future generations. The knowledge that informs this outlook has been passed down over thousands

108 Stephen May, "Language rights and language repression", in *Language Rights and Language Repression*, James W. Tollefson and Miguel Pérez-Milans, eds. (Oxford, Oxford University Press, 2018), pp. 236-254, available at https://doi.org/10.1093/oxfordhb/9780190458898.013.11.

109 Paul J. Meighan, "'What is language for us?': community-based Anishinaabemowin language planning using TEK-nology", *Language Policy*, vol. 22 (2023), pp. 223-253, available at https://doi.org/10.1007/s10993-023-09656-5.

110 Jackie Hartley, Paul Joffe and Jennifer Preston, eds., *Realizing the UN Declaration on the Rights of Indigenous Peoples: Triumph, Hope, and Action* (University of British Columbia, UBC Press, Purich Publishing, 2010), p. 191.

of years. Intergenerational learning should be actively supported and maintained so that this knowledge is not lost; young people are the future custodians of Indigenous lands, and their voices and views matter.

It is vital that nation-State Governments and policymakers remain open to change in the way they view and address climate change. There needs to be a paradigm shift; unlearning harmful colonial ideologies is just as important as activating Indigenous scientific and technical knowledge in combating climate change and restoring balance to the environment. Researchers Dramani File and Emmanuel Kanchebe Derbile emphasize the need for "an endogenous development approach to climate change planning – one that will build on Indigenous knowledge systems for effective community education, mobilization, and participatory response to climate change. Policy interventions should aim at enhancing climate change adaptation through innovations in soil and water conservation, access to water for irrigation and domestic use, climate smart-housing architecture and agroforestry within the framework of decentralization and district development planning".[111] James Ford asserts that "interdisciplinary approaches to research are required, involving collaborations across the health, natural, and social sciences, and the active engagement of Indigenous communities and organizations, health professionals, and policymakers in cooperatively planning, developing, and conducting research".[112]

1.4.8 The urgency of a collective global response

The key priorities for Indigenous Peoples, reflected in the recommendations above, have not changed; they date back to a time when Indigenous communities could gather and make decisions about their lands without fear of harm from colonizers. It is time to transform these recommendations into action so that Indigenous Peoples can once again exercise their rights with regard to their lands, territories and resources based on the principle of free, prior and informed consent. They seek to restore harmony within the global ecosystem, but this will be possible only if Indigenous approaches are supported by non-Indigenous populations and decision makers.

Protecting the natural world is a collective global responsibility. All Governments, organizations, and peoples have the capacity to recognize the value of both Western and Indigenous scientific and technical knowledge and to understand that both are necessary to address climate change and its impacts. The problem has reached critical proportions, and all those capable of contributing to mitigation efforts must work together to find sustainable solutions. The lands demand this from humanity; the world must act urgently, as if lives depend on it – because they do.[113]

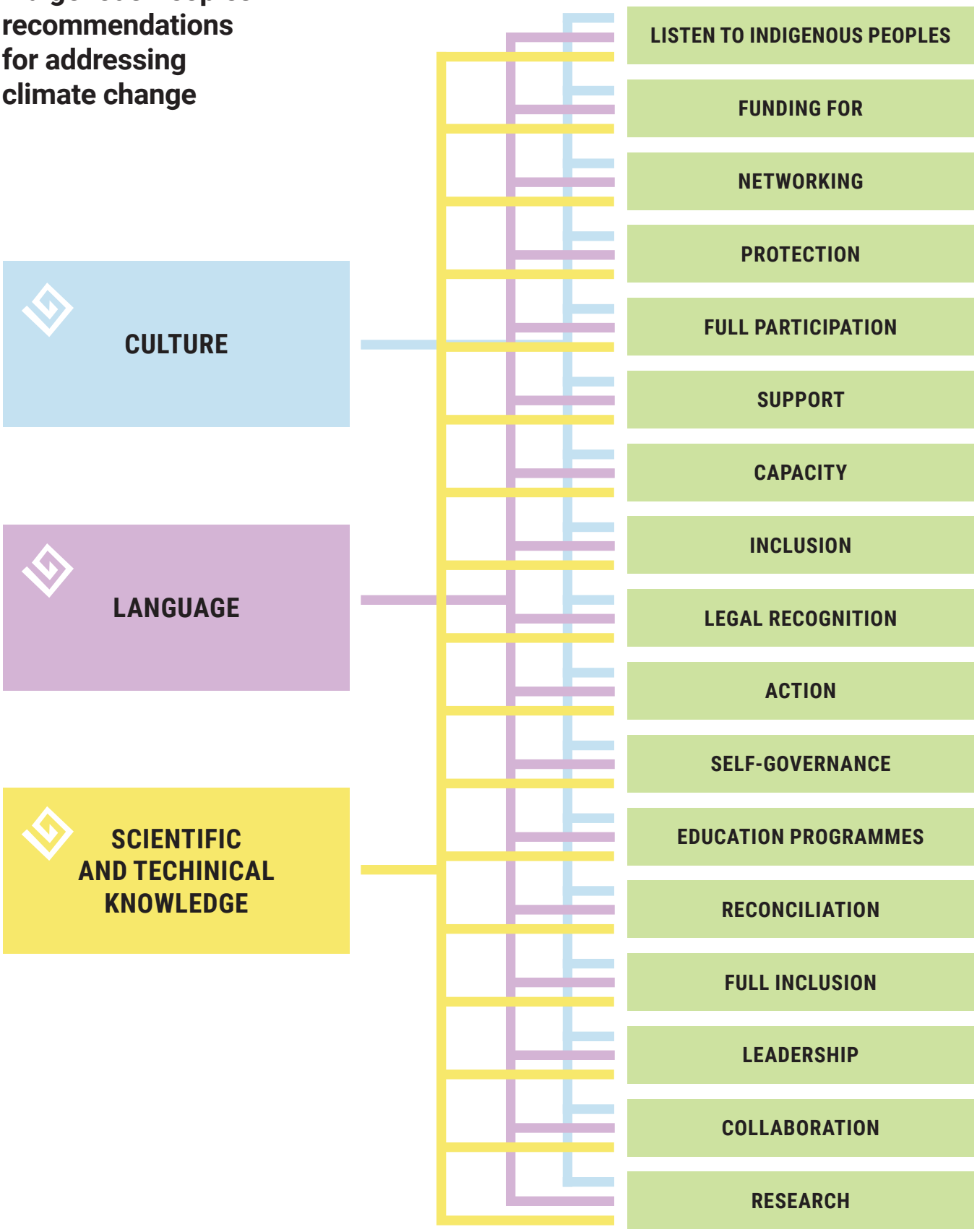
The figure shown here links recommendations by Indigenous Peoples to Indigenous culture, language, and scientific and technical knowledge, illustrating the strong interconnections and intersections that exist. The actions for these recommendations must be led by Indigenous Peoples. The necessity of involving Indigenous Peoples in climate change solutions is recognized in numerous United Nations reports and legal instruments. Indigenous Peoples are ready to work with Governments to address climate change; efforts must move forward based on an approach that is inclusive of all knowledge systems. A transformative transition is needed, as all of humanity depends on the natural world for its continued existence. Time is of the essence.

111 Dramani J.M. File and Emmanuel Kanchebe Derbile, "Sunshine, temperature and wind: community risk assessment of climate change, indigenous knowledge and climate change adaptation planning in Ghana", *International Journal of Climate Change Strategies and Management*, vol. 12, No. 1 (2020), pp. 22-38, available at https://doi/10.1108/IJCCSM-04-2019-0023.

112 James D. Ford, "Indigenous health and climate change", *American Journal of Public Health,* vol. 102, No. 7 (July 2012), pp. 1,260-1,266, available at https://pubmed.ncbi.nlm.nih.gov/22594718/.

113 United Nations Framework Convention on Climate Change, COP 26, "Unlocking climate solutions: Why Indigenous knowledge must take centre stage", YouTube live discussion hosted by One Young World (2021).

Summary of Indigenous Peoples' recommendations for addressing climate change



Credit: PAHO

Chapter 2 - Climate Change and Indigenous Health and Well-being

Chapter 2: Climate Change and Indigenous Health and Well-being

2.1 Introduction

Indigenous Peoples play a fundamental role in the conservation of biological diversity and the protection of their lands and waters, as their strengths and wisdom are intrinsically connected to everything that exists on the planet.[114] Ecological changes directly influence all facets of Indigenous Peoples' health and well-being, whether physical, emotional, mental or spiritual.[115]

Research at the interface of Indigenous health and well-being, climate change, biodiversity and the environment is prolific and continues to evolve at an exponential rate. An updated synthesis of this evidence base is crucial for mapping current pathways of impact, identifying responses across the global literature that advance Indigenous health and well-being, and centring Indigenous voices and perspectives in the discourse.[116] The present chapter is based on a review commissioned in 2023 by the Health Equity section of the World Health Organization Headquarters (WHO/HQ) Gender, Equity and Human Rights Department in collaboration with the WHO/HQ team for Biodiversity, Climate Change and Health. The report was commissioned to the Waterloo Climate Institute and carried out by an interdisciplinary research team comprising Indigenous and non-Indigenous scholars and students at the University of Waterloo and the University of Guelph. To feed into this work globally, WHO organized two engagement sessions with Indigenous experts, scholars and civil society representatives from the six WHO regions who were involved in health and various aspects of climate change,[117] which facilitated the co-development of a research plan and approach (February 2023) and the finalization of the manuscript (July 2023).

The chapter examines the impact of climate change and broader environmental degradation on the health and well-being of Indigenous Peoples, then shifts to an exploration of opportunities for Indigenous-led responses to these challenges driven by Indigenous research, knowledge and localized action. The final section focuses on shifting the narrative towards community-driven, rights-based approaches that emphasize Indigenous Peoples' sovereignty and autonomy within the climate-health space and other priority areas. This chapter is intended to support United Nations capacity-building efforts around biodiversity and health and to serve as a resource for State Governments that count Indigenous health among their policy priorities. It is hoped that the valuable insights provided can inform national climate mitigation strategies to further support the health and well-being of Indigenous Peoples and reinforce the ambitions of the United Nations Declaration on the Rights of Indigenous Peoples.

114 Rhys Jones, Alexandra Macmillan and Papaarangi Reid, "Climate change mitigation policies and co-impacts on Indigenous health: a scoping review", *International Journal of Environmental Research and Public Health*, vol. 17, No. 23 (2020), pp. 1-18, available at https://doi.org/10.3390/ijerph17239063; United Nations Permanent Forum on Indigenous Issues. "Indigenous determinants of health in the 2030 Agenda for Sustainable Development", note by the Secretariat, 31 January 2023 (E/C.19/2023/5), available at https://documents.un.org/doc/undoc/gen/n23/029/12/pdf/n2302912.pdf.

115 Agata Durkalec and others, "Climate change influences on environment as a determinant of Indigenous health: relationships to place, sea ice, and health in an Inuit community", *Social Science & Medicine*, vols. 136-137 (July 2015), pp. 17-26, available at https://doi.org/10.1016/j.socscimed.2015.04.026; Jacqueline Middleton and others, "Indigenous mental health in a changing climate: a systematic scoping review of the global literature", *Environmental Research Letters*, vol. 15, No. 5 (2020), available at https://doi.org/10.1088/1748-9326/ab68a9; Alexandra Sawatzky and others, "Responding to climate and environmental change impacts on human health via integrated surveillance in the circumpolar North: a systematic realist review", *International Journal of Environmental Research and Public Health*, vol. 15, No. 12 (2018), p. 2,706, available at https://doi.org/10.3390/ijerph15122706.

116 Edoardo Aromataris and others, "Summarizing systematic reviews: methodological development, conduct and reporting of an umbrella review approach", *International Journal of Evidence-Based Healthcare,* vol. 13, No. 3 (2015), pp. 132-140, available at https://doi.org/10.1097/XEB.0000000000000055; Maria J. Grant and Andrew Booth, "A typology of reviews: an analysis of 14 review types and associated methodologies", *Health Information and Libraries Journal*, vol. 26, No. 2 (2009), pp. 91-108, available at https://doi.org/10.1111/j.1471-1842.2009.00848.x.

117 The names of the Indigenous experts who co-shaped the review, contributed feedback, and participated in the engagement meetings may be found in the acknowledgements section of the present publication.

2.2 Examining the connections between climate and environmental change, biodiversity loss, and Indigenous health and well-being

2.2.1 The centrality of land and place to the health and well-being of Indigenous Peoples

As noted by Katy Davis and others, "the land is the heart of cultural and community life" for Indigenous Peoples.[118] Just as reviewed literature points to the centrality of land and place to Indigenous Peoples, so too does it indicate that "impacts, adaptation, and vulnerability are highly place- and culture-specific"[119] and that the "health of people and place demand an integrated engagement".[120]

Threaded through the sections that follow is the recognition that climate-health impacts are embedded in – and thus inextricably tied to – Indigenous Peoples' connections to place. These impacts relate not only to natural places but also to built places such as health-care facilities and physical infrastructure.[121] Opportunities for response and pathways for advancing Indigenous Peoples' health and well-being are similarly linked to land and place.

2.2.2 Localized, space-specific changes to ecosystems

Changes within the ecosystem invariably have direct effects on biodiversity. Many of these changes result from human activities carried out under capitalist and colonialist systems or from broader climatic and environmental change. Changes to biodiversity can be broadly described as ecosystem changes that encompass changes to physical environments and the plant and animal species therein.

Changes to physical environments are becoming increasingly extensive and severe. Aquatic,[122] atmospheric,[123] and terrestrial[124] spaces are being affected, and significant cryospheric changes across the Arctic and subarctic regions are having a profound impact on the extent and timing of the break-up and freeze-up of ice.[125]

Environmental changes are also having a tremendous impact on fish, wildlife and plant ecosystems, affecting many species important for Indigenous food systems, medicines, and livelihoods. Climatic and environmental changes have affected the overall health, abundance, distribution, migratory patterns, and predator-prey balance of key animal species upon which Indigenous

118 Katy Davis and others, "Shifting safeties and mobilites on the land in Arctic North America: a systematic approach to identifying the root causes of disaster", *Sustainability*, vol. 14, No. 12 (2022), available at https://doi.org/10.3390/su14127061.

119 James D. Ford, "Indigenous health and climate change", *American Journal of Public Health,* vol. 102, No. 7 (July 2012), pp. 1,260-1,266, available at https://doi:0.2105/AJPH.2012.300752.

120 Ursula King and Christopher Furgal, "Is hunting still healthy? Understanding the interrelationships between Indigenous participation in land-based practices and human-environmental health", *International Journal of Environmental Research and Public Health*, vol. 11, No. 6 (June 2014), pp. 5,751-5,782, available at https://doi:10.3390/ijerph110605751.

121 Andrew L. Dannenberg and others, "Managed retreat as a strategy for climate change adaptation in small communities: public health implications", *Climatic Change*, vol. 153, No. 1-2 (2019), pp. 1-14, available at https://doi.org/10.1007/s10584-019-02382-0; James D. Ford and others, "Vulnerability of Aboriginal health systems in Canada to climate change", *Global Environmental Change*, vol. 20, No. 4 (2010), pp. 668-680, available at https://doi.org/10.1016/j.gloenvcha.2010.05.003; Christine Ingemann and others, "Patient experience studies in the circumpolar region: a scoping review", *BMJ Open*, vol. 10, No. 10 (2020), available at https://doi.org/10.1136/BMJOPEN-2020-042973.

122 Karen E. McNamara, Ross Westoby and Alvin Chandra, "Exploring climate-driven non-economic loss and damage in the Pacific Islands", *Current Opinion in Environmental Sustainability*, vol. 50 (June 2021), pp. 1-11, available at https://doi.org/10.1016/j.cosust.2020.07.004.

123 Jacques Reis, Nina V. Zaitseva and Peter Spencer, "Modern environmental threats and medical challenges to the health of the population of the Arctic and subarctic regions", *Health Risk Analysis,* vol. 3 (2022), pp. 21-38, available at https://doi.org/10.21668/HEALTH.RISK/2022.3.02.

124 Amy Kipp and others, "The need for community-led, integrated and innovative monitoring programmes when responding to the health impacts of climate change", *International Journal of Circumpolar Health*, vol. 78, No. 2 (2019), art. 1517581, available at https://doi.org/10.1080/22423982.2018.1517581 ; Isabel Hagen and others, "Climate change-related risks and adaptation potential in Central and South America during the 21st century", *Environmental Research Letters*, vol. 17, No. 3 (February 2022), available at https://doi.org/10.1088/1748-9326/ac5271.

125 Gwen Healey Akearok and others, "Identifying and achieving consensus on health-related indicators of climate change in Nunavut", *Arctic: Journal of The Arctic Institute of North America*, vol. 72, No. 3 (September 2019), pp. 215-335, available at https://doi.org/10.14430/arctic68719; Laura Eerkes-Medrano and Henry P. Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere", *Frontiers in Climate*, vol. 3 (2021), pp. 1-16, available at https://doi.org/10.3389/fclim.2021.675805.

Ainu elder with traditional medicine.
Credit: Ben Powless

Peoples rely,[126] including marine mammals such as ringed and hooded seals, narwhals, and polar bears;[127] *Rangifer* species such as reindeer and caribou;[128] birds such as wild ptarmigan;[129] and fish such as char.[130] Many of these animals are "keystone species", which means they are critical for ecosystem services and functioning, and they play a vital role in Indigenous Peoples' livelihoods and well-being. This is certainly the case for bees in Melanesia[131] and *Rangifer* in Northern America.[132] According to a report on the experiences of Indigenous communities in Australia, increased heat and coastal erosion were found to be threatening the breeding patterns of turtles.[133] Environmental cues that once served as the basis for seasonal calendars are changing in ways that interfere with the ability of Indigenous communities to "read" the landscape, forcing them to make adjustments to their long-held knowledge of the workings of nature.

In Latin America, community dynamics have been affected, with the storage and preparation of culturally significant foods being impacted by rising global temperatures and the attendant risk of increased pathogen exposure and proliferation.[134] For the Sapara Nation in the Ecuadorian Amazon, an integral part of sustaining community health and resilience is engaging in knowledge-sharing hikes to identify medicinal plants. Changes in climate patterns have brought about food shortages and have impacted their ability to maintain their traditional livelihoods.

Changes in the spatial distribution and abundance of fish and shellfish stocks as a result of global warming have had both positive and negative effects on catches, economic outcomes, livelihoods, and local culture, with Indigenous Peoples dependent on fisheries experiencing adverse consequences.[135]

There have been changes in the health, productivity and agrobiodiversity of both cultivated and wild plant species (including berries and medicinal plants),[136] as well as an increase in invasive plant species that alter agriculturally significant crops and trees. Rising temperatures create favourable conditions for pests that alter vegetation as well, such as moths that affect tree species such as mountain birch and pine. secondary, and tertiary effects of climate change on Saami culture and Sápmi region; and according to a report prepared for Ngā Pae o te

126 Philip A. Loring and S. Craig Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)", *Arctic: Journal of the Arctic Institute of North America*, vol. 68, No. 3 (2015), p. 388, available at https://doi.org/10.14430/arctic4509).

127 James D. Ford and others, "Research on the human dimensions of climate change in Nunavut, Nunavik, and Nunatsiavut: a literature review and gap analysis", *Arctic: Journal of The Arctic Instiute of North America*, vol. 65, No. 3 (September 2012), pp. 289-304, available at https://doi.org/10.14430/arctic4217.

128 Inkeri Markkula, Minna Turunen and Sirpa Rasmus, "A review of climate change impacts on the ecosystems services in the Saami Homeland in Finland", *Science of the Total Environment*, vol. 20, No. 692, pp. 1,070-1,085 (November 2019), available at https://doi:10.1016/j.scitotenv.2019.07.272; Jacqueline Middleton and others, "'We're people of the snow': weather, climate change, and Inuit mental wellness", *Social Science & Medicine*, vol. 262 (October 2020), art. 113137, available at https://doi.org/10.1016/j.socscimed.2020.113137.

129 Jouni K. Jaakkola, Suvi Juntunen and Klemetti Näkkäläjärvi, "The holistic effects of climate change on the culture, well-being, and health of the Saami, the only Indigenous People in the European Union", *Current Environmental Health Reports*, vol. 5, No. 4 (2018), pp. 401-417, available at https://doi.org/10.1007/s40572-018-0211-2; Bianca Van Bavel and others, "Contributions of scale: what we stand to gain from Indigenous and local inclusion in climate and health monitoring and surveillance systems", *Environmental Research Letters*, vol. 15, No. 8 (2020), available at https://doi.org/10.1088/1748-9326/ab875e.

130 Silja Zimmermann and others, "A leverage points perspective on Arctic Indigenous food systems research: a systematic review", *Sustainability Science*, vol. 18 (2023), pp. 1,481-1,500, available at https://doi.org/10.1007/s11625-022-01280-2; Mojtaba Shafiee and others, "Food security status of Indigenous Peoples in Canada according to the 4 pillars of food security: a scoping review", *Advances in Nutrition*, vol. 13, No. 6 (2022), pp. 2,537-2,558, available at https://doi.org/10.1093/advances/nmac081.

131 Chris Vogliano and others, "Progress towards SDG 2: zero hunger in Melanesia – a state of data scoping review", *Global Food Security*, vol. 29 (June 2021), art. 100519, available at https://doi.org/10.1016/j.gfs.2021.100519.

132 David Borish and others, "Relationships between *Rangifer* and Indigenous well-being in the North American Arctic and subarctic: a review based on the academic published literature", *Arctic: Journal of the Arctic Institute of North America*, vol. 75, No. 1 (March 2022), pp. 1-148, available at https://doi.org/10.14430/arctic74870.

133 Health Environments and Lives (HEAL) Network and Centre for Research Excellence in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE), "Climate change and Aboriginal and Torres Strait Islander health: discussion paper" (Melbourne, Lowitja Institute, 2021), available at https://apo.org.au/node/314958.

134 Matthew Little and others, "Drivers and health implications of the dietary transition among Inuit in the Canadian Arctic: a scoping review", *Public Health Nutrition*, vol. 24, No. 9 (2020), pp. 2,650-2,668, available at https://doi.org/10.1017/S1368980020002402.

135 Intergovernmental Panel on Climate Change, *The Ocean and Cryosphere in a Changing Climate: Special Report of the Intergovernmental Panel on Climate Change* (Cambridge, United Kingdom, Cambridge University Press, 2019), available at https://doi.org/10.1017/9781009157964.

136 John W. Creswell and Dana L. Miller, "Determining validity in qualitative inquiry", Theory into Practice, vol. 39, No. 3 (2000), pp. 124-130, available at https://doi.org/10.1207/s15430421tip3903_2; Walter Leal Filho and others, "Understanding responses to climate-related water scarcity in Africa", *Science of The Total Environment*, vol. 806, part 1 (February 2022), art. 150420, available at https://doi.org/10.1016/j.scitotenv.2021.150420.

Māramatanga, "the quality of medicinal (traditional/*rongoa* and modern) products from key species [within New Zealand] may be compromised. … Forest ecosystems (both Indigenous and managed) are … likely to be affected by cascading climate-induced interactions with introduced herbivores and weed species, and the consequences of such changes are potentially significant for threatened and rare terrestrial ecosystems."[137]

The impacts of biodiversity changes on human health and well-being are significant. Land degradation and biodiversity loss have cascading effects on local residents relying on ecosystem services. A report focused on building climate resilience with Indigenous youth from South-Eastern Asia draws attention to the fact that the primary sources of income for Indigenous Peoples in the area depend on the conservation and sustainability of high agrobiodiversity.[138] Raw materials used for woven fabrics and traditional foods have been impacted by high temperatures, resulting in lower-quality products and outputs and disrupting household incomes. The changing climate patterns of droughts, extreme monsoons, floods, and hurricanes have created a chain of events impacting the nutritional and economic use of biodiverse crops. Indigenous pastoralists in Africa have experienced challenges that affect pasture and feed supplies, threatening their livestock and livelihoods.[139] Pastoralists are guided by traditional weather forecasting practices developed through observation of the land and rely on mobility, actively moving from place to place with their livestock.[140] However, many are becoming refugees, compelled by climate change impacts to join the competitive search for high-quality pastureland and water.[141] In Chad, Kenya and Morocco, for example, droughts have created tensions between land and water, impacting the nomadic way of life. The loss of traditional livelihoods is exacerbating existing social, economic and environmental pressures, triggering conflicts and insecurity.[142]

2.2.3 The proximal impact of environmental degradation on the health of Indigenous Peoples

Environmental changes are having proximal effects on the physical and mental health of Indigenous Peoples around the world. Impacts include acute and chronic physiological responses (such as illness and disease), psychological and behavioural challenges, increases in infectious diseases (including vector-borne, foodborne and waterborne illnesses), and nutrition-related conditions and diseases. Changes to the environment are also associated with growing threats to human safety due to infrastructure instability, increased wild animal attacks, and unpredictable weather patterns.

The proximal impacts of observed ecosystem changes on human health and human environments include climate effects related to air, water and land. Water-related effects include extreme and unpredictable weather events, changing ice conditions, precipitation changes, drought, flooding, lower inland water levels, sea-level rise, warming waterways, decreased water quality, and glacier retreat. Air-related climate effects include changes in temperature, humidity, air quality, seasons, and atmospheric conditions. Land-related impacts include changes in snow composition, permafrost thaw, ecological situation and ongoing sanitary-epidemiological processes. The systemic review includes research articles available in PubMed (maintained by The United States National Library of Medicine at the National Institutes of Healthvegetation, landscape hazards (from erosion or landslides), and exposure to toxins or other forms of contamination (from ice melt or algae blooms).

137 Shaun Awatere and others, "He huringa āhuarangi, he huringa ao: a changing climate, a changing world", Te Arotahi Paper Series, No. 7, October 2021 (Manaaki Whenua Landcare Research, prepared for Ngā Pae o te Māramatanga), p. 7, available at http://www.maramatanga.ac.nz/te-arotahi-07.

138 Anneleen Van Uffelen and others, *Indigenous Youth As Agents of change: Actions of Indigenous Youth in Local Food Systems during Times of Adversity* (Rome, Food and Agriculture Organization of the United Nations, 2021), available at https://doi.org/10.4060/cb6895en.

139 Minority Rights Group International, *Minority and Indigenous Trends 2019: Focus on Climate Justice* (London, 2019), available at https://minorityrights.org/resources/minority-and-indigenous-trends-2019-focus-on-climate-justice/.

140 Ariel Ahearn, Martin Oelz and Rishabh Dhir, *Indigenous Peoples and Climate Change: Emerging Research on Traditional Knowledge and Livelihoods* (Geneva, International Labour Organization, 2019), available at http://www.ilo.org/global/topics/indigenous-tribal/publications/WCMS_686780/lang--en/index.htm.

141 World Meteorological Organization, *State of the Climate in Africa 2021* (Geneva, 2022), available at https://wmo.int/publication-series/state-of-climate-africa-2021.

142 Gideon Sanago, "How Indigenous Peoples in Africa are impacted by climate change", International Work Group for Indigenous Affairs, news article, 19 November 2022, available at https://www.iwgia.org/en/news/4959-how-indigenous-peoples-in-africa-are-impacted-by-climate-change.html.

These ecosystem changes are having an adverse impact on human health, and the situation is only likely to deteriorate in the coming years. As noted by Ford and others, "health outcomes with a strong link to climate are expected to increase in prevalence with warming temperatures and changing precipitation regimes".[143] Broad health outcomes include an overall increase in the susceptibility to disease[144] and higher rates of mortality.[145] Acute and chronic physiological impacts are common and include increased UVB exposure[146] and heat stress and a higher prevalence of cardiovascular disease, respiratory illnesses such as asthma, and airborne diseases.[147] A recent report from the Intergovernmental Panel on Climate Change (IPCC) confirms that the negative health impacts of cryosphere change include higher risks of foodborne and waterborne diseases, water contamination, undernutrition, injury, and mental health challenges for those living in the circumpolar North.[148] Psychological and behavioural challenges have also been observed, including an upward trend in feelings of worry, sadness, anger, and emotional distress, as well as heightened reliance on maladaptive coping strategies such as substance abuse, self-harm, gambling, and family violence.[149] Through community observations, Jacqueline Middleton and others have concluded that the cumulative effects of chronic exposure to climate stressors can lead to poor mental health outcomes.[150]

There has been a notable increase in infectious diseases, including vector-borne, foodborne, and waterborne diseases, across different geographies.[151] Habitat loss, changes in precipitation and temperature, and compromised water quality and sanitation affect pathogen distribution, diversity, density, and magnitude. Vector-borne diseases such as the West Nile virus, malaria, Chagas disease, yellow fever, leishmaniasis, and schistosomiasis are most often linked to vector-carrying organisms and climate factors that disturb breeding sites.[152] In Africa and Latin America, increases in outbreaks of waterborne diseases (such as cholera and bacterial gastroenteritis) and other infectious diseases (such as dysentery, zoonoses and soil-transmitted helminthiases) have been reported and are believed to be linked to chronic drought conditions and water contamination.[153] In Western Asia, water scarcity is a source of tension in Jordan, the second most water-stressed country in the world, disrupting equitable access to water for the Indigenous Bedouin Peoples and amplifying their health risks.[154] Vulnerable populations such as older adults and children in lower-resource settings, as well as those already experiencing malaria, undernutrition, and diarrhoea, are at further risk for heat-related illnesses. Foodborne diseases (including E. coli, botulism, salmonella, trichinella and brucellosis) are also of significant concern among communities of Indigenous Peoples in circumpolar Northern America, where temperature changes compromise traditional food storage methods.[155] In rural areas across the world, health-care access tends to be more precarious and infrastructure quality poorer, exacerbating the impacts

143 Ford and others, "Vulnerability of Aboriginal health systems in Canada to climate change".
144 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere".
145 Leal Filho and others, "Understanding responses to climate-related water scarcity in Africa".
146 King and Furgal, "Is hunting still healthy? Understanding the interrelationships between Indigenous participation in land-based practices and human-environmental health".
147 Monalisha Sahu and others, "Measuring impact of climate change on Indigenous health in the background of multiple disadvantages: a scoping review for equitable public health policy formulation", *Journal of Prevention,* vol. 44 (2023), pp. 421-456, available at https://doi.org/10.1007/s10935-022-00718-8.
148 IPCC, *The Ocean and Cryosphere in a Changing Climate: Special Report of the Intergovernmental Panel on Climate Change*.
149 Laurence Lebel and others, "Climate change and Indigenous mental health in the circumpolar North: a systematic review to inform clinical practice", *Transcultural Psychiatry*, vol. 59, No. 3 (2022), pp. 312-336, available at https://doi.org/10.1177/13634615211066698.
150 Jacqueline Middleton and others, "Indigenous mental health in a changing climate: a systematic scoping review of the global literature".
151 Gabriel Luke Kiddle and others, "An Oceania urban design agenda linking ecosystems services, nature-based solutions, traditional ecological knowledge and wellbeing", *Sustainability,* vol. 13, No. 22 (2021), available at https://doi.org/10.3390/su132212660; James D. Ford and others, "Mapping human dimensions of climate change research in the Canadian Arctic", *Ambio*, vol. 41, No. 8 (2012), pp. 808-822, available at https://doi.org/10.1007/s13280-012-0336-8.
152 Hagen and others, "Climate change-related risks and adaptation potential in Central and South America during the 21st century".
153 Gina E.C. Charnley, Ilan Kelman and Kris A. Murray, "Drought-related cholera outbreaks in Africa and the implications for climate change: a narrative review", *Pathogens and Global Health*, vol. 116, No. 1 (2022), pp. 3-12, available at https://doi.org/10.1080/20477724.2021.1981716.
154 Hannah Tait Neufeld, Lena Maria Nilsson and Rhys Griffith Jones, "Indigenous Peoples' health and well-being in a changing climate", in Intergovernmental Panel on Climate Change, *Climate Change 2022: Impacts, Adaptation and Vulnerability – Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Hans-Otto Pörtner and others, eds. (Cambridge, United Kingdom, and New York, Cambridge University Press, 2022), pp. 1,054-1,058, available at https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf.
155 Ford, "Indigenous health and climate change".

of increased infectious disease prevalence due to climate change.[156]

Beyond threats to food safety from foodborne illnesses, nutrition-related impacts are becoming more prevalent. Indigenous Peoples worldwide are experiencing the detrimental effects of both undernutrition and metabolic disturbances resulting from overnutrition and obesity.[157] This is primarily caused by the diminished availability or safety of local and traditional foods, which has led to increased reliance on imported substitutes. Young children are particularly vulnerable to these challenges in areas such as the Peruvian Amazon, where food security is deteriorating and the challenges of chronic malnutrition are increasing.[158] A report on Shawi households notes that biodiversity impacts affecting the local Amazon ecosystem have made it difficult for families to maintain an adequate and nutritious diet.[159] Globally, food security and nutritional adequacy have been further undermined by the combination of warming temperatures and the recent COVID-19 pandemic and its aftermath. The increase in climate-driven food insecurity has had a negative impact on the quality of diets, with biodiversity loss and ecosystem changes reducing access to traditional foods and contributing to nutrient deficiencies. This shift away from traditional foods, known for their nutrient density, has invariably led to greater reliance on market foods, resulting in the increased prevalence of metabolic conditions and nutrition-related diseases.[160] Changing exposures and sensitivities to contaminants in food sources (including heavy metals, persistent organic pollutants, polychlorinated biphenyls, and organochlorine pesticides) from bioaccumulation in the food chain have also been reported.[161] In the context of seafood security, the ecosystem loss of coral reefs due to increasing water temperatures have potentially led to nutritional health risks through dietary shifts among communities in the circumpolar North, Western Africa, and several small island developing States. Winter thaw, rain-on-snow, and refreezing events that contribute to creating ice crust or increasing its thickness have had a negative effect on reindeer pasture conditions in the circumpolar North, as reindeer cannot access food underneath the ice cover.[162]

Finally, global ecosystem changes are intensifying threats to human safety. Most notably, natural calamities or environmental hazards such as flooding increase the chances of accidental injury or death. Subsequent erosion exacerbates health risks by causing infrastructure instability, particularly in coastal regions of Latin America and the circumpolar North.[163] Preventive or post-disaster relocation may be viewed as an adaptation strategy in such situations; however, various researchers have observed that injury can occur before, during, or after managed or unmanaged retreat actions. The increase in predators and wild animal attacks is also a safety concern.[164] In the circumpolar North, unstable ice conditions and unpredictable weather patterns have presented serious risks to people travelling out to engage in traditional activities such as hunting, harvesting, or herding.[165] The IPCC reports that "pastoralists in many regions may experience changes in livestock behaviour due to climate change, leading to increased mobility-related health hazards".[166] In addition to presenting direct risks, impacts on travel routes can impede access to health care and transportation to hospitals. Broadly

156 Julia M. Bryson and others, "Neglected tropical diseases in the context of climate change in East Africa: a systematic scoping review", *The American Journal of Tropical Medicine and Hygiene*, vol. 102, No. 6 (2020), pp. 1,443-1,454, available at https://doi.org/10.4269/ajtmh.19-0380.
157 Neufeld, Nilsson and Jones, "Indigenous Peoples' health and well-being in a changing climate".
158 Minority Rights Group International, *Minority and Indigenous Trends 2019: Focus on Climate Justice*.
159 Ibid.
160 Zimmermann and others, "A leverage points perspective on Arctic Indigenous food systems research: a systematic review".
161 Loring and Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)".
162 Jaakkola, Juntunen and Näkkäläjärvi, "The holistic effects of climate change on the culture, well-being, and health of the Saami, the only Indigenous People in the European Union".
163 Hagen and others, "Climate change-related risks and adaptation potential in Central and South America during the 21st century".
164 Shafiee and others, "Food security status of Indigenous Peoples in Canada according to the 4 pillars of food security: a scoping review"; Dannenberg and others, "Managed retreat as a strategy for climate change adaptation in small communities: public health implications"; Sahu and others, "Measuring impact of climate change on Indigenous health in the background of multiple disadvantages: a scoping review for equitable public health policy formulation".
165 Tristan Pearce and others, "Advancing adaptation planning for climate change in the Inuvialuit Settlement Region (ISR): a review and critique", *Regional Environmental Change*, vol. 11, No. 1 (2011), pp. 1-17, available at https://doi.org/10.1007/s10113-010-0126-4.
166 Guéladio Cissé and others, "Health, wellbeing and the changing structure of communities", chap. 7 in *Climate Change 2022: Impacts, Adaptation and Vulnerability – Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Hans-Otto Pörtner and others, eds. (Cambridge, United Kingdom, and New York, Cambridge University Press, 2022), p. 1,054, available at https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf.

Akha women collecting tea in Thailand. Credit: Canva

speaking, the changes and unpredictability deriving from environmental disruptions have been very limiting for Indigenous Peoples, whose deep knowledge of geographical and ecosystem dynamics have long allowed them to move freely and safely through natural spaces that are often quite extensive. Some Indigenous communities have shared with Davis and others that present conditions induce a sense of entrapment.[167]

2.2.4 Intermediate challenges: changing human environments

Climate change and other ecosystem disruptions are having notable intermediate impacts on human environments and livelihood systems, with food and water systems being particularly affected. Changes to the ecosystem can reduce the quality, availability, and accessibility of traditional food and water sources and exacerbate food insecurity. As noted previously, environmental constraints affecting key subsistence systems are changing traditional food cultures and increasing reliance on market foods. Climate change impacts on Indigenous Peoples' food and water systems are a global phenomenon.[168] Vulnerabilities related to harvesting constrain traditional subsistence activities such as hunting, fishing and foraging. Across geographies, agroecosystem productivity has been seriously diminished, significantly reducing land productivity, food and medicine diversity, and drinking water quality and availability.[169] Water scarcity is a

167 Davis and others, "Shifting safeties and mobilites on the land in Arctic North America: a systematic approach to identifying the root causes of disaster".

168 Steven Lam and others, "Community-based monitoring of Indigenous food security in a changing climate: global trends and future directions", *Environmental Research Letters*, vol. 14, No. 7 (2019), pp. 1-14, available at https://iopscience.iop.org/article/10.1088/1748-9326/ab13e4.

169 Himangana Gupta, Maiko Nishi and Alexandros Gasparatos, "Community-based responses for tackling environmental and socio-economic change and impacts in mountain social–ecological systems", *Ambio,* vol. 51, No. 5 (2022), pp. 1,123-1,142, available at https://doi.org/10.1007/s13280-021-01651-6.

particular concern in the global South and is seen as a key driver of food insecurity and disease. The health status and distribution of important wildlife species in the circumpolar North, including various fish species and *Rangifer* species such as caribou and reindeer, are also impacted by environmental factors that negatively affect food sources, habitats, disease risk, or herding practices.[170]

Erosion, permafrost melt, and other impacts of changing weather patterns are damaging or destroying local infrastructure and other built environments. This progressive deterioration disrupts transportation routes, threatens cultural sites, jeopardizes the availability of secure shelter, amplifies health-care access or system deficiencies, and necessitates increased mobility or relocation.[171] More frequent wildfires and flooding have been responsible for the loss of homes and other structures, sometimes affecting entire communities. These same natural events have impacted respiratory health at the household level; in Mexico, there have been concerning reports that the prevalence of respiratory disease among Indigenous Peoples is nearly twice that among non-Indigenous Peoples. In Alaska and northern Canada, Inuit and First Nation communities have reported increases in mold (fungi) in their homes.[172]

The integrity of community infrastructures and the viability of communities are being threatened. Droughts disrupt rural livelihoods in Africa and accelerate urban expansion by forcing people to relocate in search of stable employment.[173] Extreme weather events and the infrastructure damage they cause can have a detrimental effect on health-care access or exacerbate health-care system deficiencies. Both the increased threat of natural disasters (evidence of sustained upward trends in frequency and magnitude) and the actual destruction caused by these events have a profound impact on communities across all sociocultural regions – often necessitating heightened mobility, migration or relocation.[174] A thematic report issued by the United Nations Special Rapporteur on the rights of Indigenous Peoples includes an account of the Kuna People of Panama and their forced relocation to the mainland due to rising sea levels and flooding.[175] Ocean changes are of concern for small island States and coastal cities and communities. Beyond possible reductions in marine food supply and related livelihood risks, their health, safety and well-being are imperiled. Rising sea levels and warming oceans can lead to more powerful tropical storms, threatening coastal infrastructure (including ports and wastewater drainage systems) used to protect the coastline. Ocean and cryosphere changes can contribute to cultural losses and have significant economic impacts on established tourist destinations. In some situations, the most appropriate response may involve relocating critical services and, in high-risk cases, Indigenous Peoples themselves. Relocated communities in Fiji spoke to the benefits of relocation, including movement away from environmental risks, new livelihood opportunities, and increased access to adequate drinking water, health services, and education.[176] While it is true that relocation offers a number of advantages, including increased safety and security, the prospect of relocating to areas outside their traditional lands and territories can be more distressing to Indigenous communities than the immediate threat of natural calamities. Acts of relocation pose threats to ancestral seed knowledge, the preservation of sacred aquifers, and other aspects of Indigenous existence that are integral to a sense of place and connection to their lands. This dynamic makes it imperative that Indigenous Peoples play an active role not only in climate change mitigation but in all decisions that affect their lives.

170 Sean A. Hillier and others, "Examining the concept of One Health for Indigenous communities: a systematic review" *One Health*, vol. 12 (June 2021), art. 100248, available at https://doi.org/10.1016/j.onehlt.2021.100248.
171 Ford and others, "Vulnerability of Aboriginal health systems in Canada to climate change".
172 Neufeld, Nilsson and Jones, "Indigenous Peoples' health and well-being in a changing climate".
173 Charnley, Kelman and Murray, "Drought-related cholera outbreaks in Africa and the implications for climate change: a narrative review".
174 Sahu and others, "Measuring impact of climate change on Indigenous health in the background of multiple disadvantages: a scoping review for equitable public health policy formulation"; Hagen and others, "Climate change-related risks and adaptation potential in Central and South America during the 21st century".
175 United Nations, Human Rights Council, "Indigenous women and the development, application, preservation and transmission of scientific and technical knowledge", report of the Special Rapporteur on the rights of Indigenous Peoples, José Francisco Calí Tzay, 9 August 2022 (A/HRC/51/28), available at https://documents.un.org/doc/undoc/gen/g22/446/68/pdf/g2244668.pdf.
176 Celia McMichael and Teresia Powell, "Planned relocation and health: a case study from Fiji", *International Journal of Environmental Research and Public Health*, vol. 18, No. 8 (2021), 4355, available at https://doi.org/10.3390/ijerph18084355.

2.2.5 Distal challenges: Indigenous Peoples' relationships with place, culture, and each other

Climate-driven changes in the human environment also give rise to distal impacts on the health and well-being of Indigenous Peoples, affecting their relationships with place, culture, and one another. As ecosystem changes alter the physical landscape and disturb natural cycles, relationships Indigenous Peoples have with their lands are disrupted. Cultural, social, and historical ties to the land continue to be diminished through climate-driven shifts such as changes in income and increased mobility, which affect social connections and feelings of kinship at the community level. Such impacts affect an individual's sense of identity, self-worth, and ability to participate in socially supportive cultural practices.

Ecosystem changes trigger interpersonal and relational changes linked to spiritual and family life, oral history, and culture. Relational challenges affect a person's sense of place, kinship, and identity. This is significant in Indigenous contexts because "when physical landscapes change, stories, memories, or meanings may also change or fade away".[177] In practical terms, climate change can lead to increased mobility, the loss of housing, or changes in income or cultural dynamics, which can weaken historical, social or cultural ties to the land.[178] At the human level, relational changes to place have implications for social connections and changes in community-level kinship. For example, reduced access to traditional foods threatens the viability of food-sharing networks and other traditional practices dependent on community collaboration or social connections to the land.[179] These challenges affect individuals and their sense of identity in profound and very personal ways. Changes in the physical landscape and the availability of traditionally important resources interfere with people's ability to engage in cultural practices, ultimately affecting their sense of self or self-worth.[180]

Ecosystem changes have an impact on traditional knowledge and cultural norms that is somewhat indirect but potentially devastating. Indigenous Peoples have experienced losses, disruptions, reduced relevance, and unreliability in the use and transmission of traditional knowledge. In the circumpolar North, there are serious concerns about the transmission of Indigenous knowledge to younger generations, given the observable erosion of land skills and institutional memory.[181] This trend is worrisome since Indigenous land-based practices are recognized for their positive contribution to maintaining healthy social relations and a health environment. Unfortunately, ecosystem changes are disrupting age-old norms and traditional practices, effectively contributing to "culturecide".[182]

Changing human environments also weaken the fabric of Indigenous cultures by indirectly contributing to cultural shifts or negotiations that challenge established norms. In the circumpolar North, for example, Indigenous hunters have begun to request cash payment for traditional foods and have switched to harvesting practices that "favour financial rewards from meat production rather than the aims of traditional husbandry".[183] Other contextual forces, such as economics and the effects of modernization (including nutritional transitions and wage-based economies) further compound these impacts and force people to negotiate their needs.

Many of these distal impacts are exacerbating emotional and psychological health challenges, contributing to higher levels of stress, anxiety, and depression among individuals, as well as an increase in social pathologies, interpersonal stress, intrafamilial tension, and rights-based conflicts (linked to resource deficits, for example). Ecosystem changes can constrain Indigenous Peoples' ability to engage with the land in ways that are necessary to sustain their mental and emotional well-being. When cultural markings and important species decline, it becomes an emotional issue for many people and impacts multiple determinants of mental health.[184] Those

177 Markkula, Turunen and Rasmus, "A review of climate change impacts on the ecosystems services in the Saami Homeland in Finland".
178 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere".
179 Little and others, "Drivers and health implications of the dietary transition among Inuit in the Canadian Arctic: a scoping review".
180 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere".
181 Akearok and others, "Identifying and achieving consensus on health-related indicators of climate change in Nunavut".
182 McNamara, Westoby and Chandra, "Exploring climate-driven non-economic loss and damage in the Pacific Islands".
183 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere".
184 Lebel and others, "Climate change and Indigenous mental health in the circumpolar North: a systematic review to inform clinical practice".

Cree doctor at the clinic. Credit: Terry Reith

reduced to earning a subsistence living report increased stress, anxiety, disrupted sleep, and depression.[185] Several reviews across a wide range of geographical areas note an increase in social pathologies (including family violence, addiction, poverty and suicide), interpersonal stress, conflicts, and intrafamilial tension, sometimes over resource rights or as a result of resource deficits. In the circumpolar North, vicarious stress has been reported among people empathizing with those experiencing extreme environmental conditions.[186] A sense of powerlessness over these conditions has been found to jeopardize people's spiritual well-being.[187]

Impacts on Indigenous sovereignty and self-determination are a concern, particularly among the Inuit in the circumpolar North[188] and Indigenous communities across Africa. Indigenous Peoples in these and other regions worry about the loss of autonomy and nationality. As Middleton and others assert, ecosystem changes can be seen to limit people's ability to exercise self-determination, "such that climate change [is] framed as a driver of 'environmental dispossession'".[189]

In certain contexts, climate change is not the only threat; mitigation policies can also put Indigenous livelihoods at risk. There are reports highlighting the loss of land rights and threats of eviction for Indigenous Peoples,

185 Jaakkola, Juntunen and Näkkäläjärvi, "The holistic effects of climate change on the culture, well-being, and health of the Saami, the only Indigenous People in the European Union".

186 Middleton and others, "Indigenous mental health in a changing climate: a systematic scoping review of the global literature", p. 11.

187 McNamara, Westoby and Chandra, "Exploring climate-driven non-economic loss and damage in the Pacific Islands".

188 Little and others, "Drivers and health implications of the dietary transition among Inuit in the Canadian Arctic: a scoping review".

189 Laura Jane Brubacher and others, "Climate change, biodiversity loss, and Indigenous Peoples' health and well-being: a systematic umbrella review", *PLOS Global Public Health*, vol. 4, No. 3 (2024), citing Middleton and others, "Indigenous mental health in a changing climate", p. 11.

particularly in the African region. The removal of the Batwa from their homelands in the Bwindi Forest of Uganda exposed them to damaging climate change impacts, and the eviction of the Indigenous Sengwer from the Embobut Forest in Kenya led to an increase in violence.[190] The identity of Indigenous communities is inextricably linked to their lands, whether it be tropical forests, high-altitude zones, coasts, tundra, or deserts. The disruptive changes to lands and waters directly affect the ability of Indigenous Peoples to engage in sustainable land management, which is tied to formal legal, cultural, and spiritual obligations to care for ancestral lands and waters.[191]

2.3 Gendered impacts of climate change on Indigenous Peoples' health and well-being

Sex and gender are important factors related to climate change impacts and biodiversity loss, yet there is very little literature that explores this important connection. Reports that address gender in relation to climate change do so within a woman/man binary context, neglecting to include or acknowledge gender-diverse persons. Within this limited framework, climate-related health risks and outcomes are associated with gendered household and community roles and responsibilities. Men and women experience different mental, emotional, and psychosocial impacts linked to changes in their roles. They also differ in terms of chronic and acute disease susceptibility and mental illness. In broad terms, gendered impacts identified in the reviewed literature have mapped most closely to the proximal and distal impacts of environmental change.

Health-related risks and outcomes associated with climate change may differ according to gendered-household or community roles and responsibilities. Globally, women often have more caregiving responsibilities, which may increase their proximity to certain pathogens; this is the case in East Africa, where women are more vulnerable to neglected tropical diseases such as human African trypanosomiasis, leishmaniasis, schistosomiasis, and soil-transmitted helminthiases. This may be due to differences in biological susceptibility and gender-role-related exposure.[192] Women and men may also experience different mental, emotional, or psychosocial impacts from the role adjustments linked to climate change, including the loss of pride and self-worth among men whose hunting activities are limited[193] or the loss of social supports among women whose partners migrate for work.[194] Within certain cultural contexts, gender norms can limit participation in activities such as hunting, influencing access to food and other resources.[195]

Specific climate-related health outcomes often differ for men and women. For instance, women reportedly have a higher risk of metabolic conditions such as obesity and type 2 diabetes,[196] lower vitamin D levels and a higher risk of iron deficiency,[197] lasting mental health impacts due to climate-related relocation,[198] and higher susceptibility to neglected tropical diseases.[199] Climate-induced food insecurity and food contamination have been shown to impact the health and micronutrient intake of pregnant women.[200] The prevalence of

190 Minority Rights Group International, *Minority and Indigenous Trends 2019: Focus on Climate Justice.*
191 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, Eduardo Brondizio and others, eds. (Bonn, IPBES secretariat, 2019), available at https://doi.org/10.5281/zenodo.3831673.
192 Bryson and others, "Neglected tropical diseases in the context of climate change in East Africa: a systematic scoping review".
193 Lebel and others, "Climate change and Indigenous mental health in the circumpolar North: a systematic review to inform clinical practice".
194 Leal Filho and others, "Understanding responses to climate-related water scarcity in Africa".
195 Loring and Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)".
196 Jaakkola, Juntunen and Näkkäläjärvi, "The holistic effects of climate change on the culture, well-being, and health of the Saami, the only Indigenous People in the European Union".
197 Little and others, "Drivers and health implications of the dietary transition among Inuit in the Canadian Arctic: a scoping review".
198 McNamara, Westoby and Chandra, "Exploring climate-driven non-economic loss and damage in the Pacific Islands".
199 Bryson and others, "Neglected tropical diseases in the context of climate change in East Africa: a systematic scoping review".
200 Sahu and others, "Measuring impact of climate change on Indigenous health in the background of multiple disadvantages: a scoping review for equitable public health policy formulation".

negative mental health outcomes is purportedly different among men[201] and women, with higher rates of suicide reported among men and increased symptoms of solastalgia[202] among women in response to observed/lived climatic changes.[203] A report from Australia describes the subtle differences in emotional responses across genders and age groups, with Elders experiencing intensified feelings of solastalgia due to their longer experience of being connected to their lands.[204] A 2022 report of the Special Rapporteur on the rights of Indigenous Peoples to the United Nations Human Rights Council relates that Indigenous women bear a disproportionate burden from the ecological, economic, and spiritual consequences of extractive industry operations on their lands.[205] The loss of land access and ownership disempowers Indigenous women, jeopardizing their community roles, livelihoods, and transmission of scientific and technical knowledge. Gendered health consequences are related to the positions and power dynamic of women and men in their cultural contexts, with gender roles influenced by their different capacities, vulnerabilities, and resources.[206]

Climate-driven shifts in social, economic, cultural, family, and community roles and norms have had a profound impact on Indigenous Peoples. A report on African trends highlights the increase in family conflicts in pastoral situations due to the time spent away from home to support new livestock production regimes.[207] Family structures and roles have also been affected by the loss of livestock, which has weakened the gender role of males as the source of household support and dowry provision. Indigenous women are often regarded as custodians of biodiversity, bearing responsibility for gathering, fishing, and undertaking agricultural tasks, as well as preserving traditional knowledge through its transmission across generations. The M'boboro women in Chad possess advanced knowledge of hydrology relating to the harvesting of rainwater and the conservation of specific tree and plant species that safeguard water sources.[208] Indigenous women in Belize are regarded as river fisher folk and forest gatherers who possess rich knowledge of the health of rivers and forests. Indigenous women in Colombia make planting decisions, selecting the seeds to plant for sowing seasons.[209] The position and role of Indigenous women as holders of agricultural knowledge in Colombia and elsewhere is important in the transmission of this knowledge across generations. However, the imbalances caused by climate change have seriously diminished the applicability of traditional agricultural knowledge, disrupting community solidarity and the preservation of culture. Patriarchal norms and behaviours related to the "male prerogative" in historical cultural contexts prevent women from sharing their concerns or taking on new roles; in such contexts, Indigenous women are unable to speak freely in community meetings and are limited in terms of their ability to proactively respond to climate change impacts. Gendered sociocultural norms can also dictate the extent to which Indigenous women participate in and benefit from decision-making processes in land allocation processes. Their knowledge is often devalued, and the loss of land access and ownership can lead to a sense of disempowerment among Indigenous women that threatens their roles and place in the community.[210] This systemic discrimination is rooted in perceptions surrounding the gender role of Indigenous women as keepers of the home; the idea that women could

201 Reis, Zaitseva and Spencer, "Modern environmental threats and medical challenges to the health of the population of the Arctic and subarctic regions".
202 Solastalgia is broadly defined as the distress caused by the transformation and degradation of one's home environment. It is a relatively new concept linked to the environment–health–place nexus.
203 Middleton and others, "Indigenous mental health in a changing climate: a systematic scoping review of the global literature".
204 HEAL Network and CRE-STRIDE, "Climate change and Aboriginal and Torres Strait Islander health: discussion paper".
205 United Nations, Human Rights Council, "Indigenous women and the development, application, preservation and transmission of scientific and technical knowledge".
206 Job Eronmhonsele and Mercy Omuero Adejeghwro, "Climate change and its implication on women's health in the Niger Delta region", CPED Policy Brief Series, No. 1 (2019), available at https://africaportal.org/wp-content/uploads/2023/05/Climate_change_and_its_implication_on_womens_health-1.pdf.
207 Minority Rights Group International, *Minority and Indigenous Trends 2019: Focus on Climate Justice*.
208 United Nations, Human Rights Council, "Indigenous women and the development, application, preservation and transmission of scientific and technical knowledge".
209 UNESCO, "Mobilizing Indigenous and local knowledge solutions: addressing climate impacts and vulnerabilities – a perspective from the Caribbean Region, Georgetown, Guyana, 3-5 September 2019" (SC-SII/2020/ME/ILKCC/CBN) (2020), available at https://unesdoc.unesco.org/notice?id=p::usmarcdef_0000375025.
210 United Nations, Human Rights Council, "Indigenous women and the development, application, preservation and transmission of scientific and technical knowledge".

assume additional roles – serving as both homemaker and breadwinner, for example – is rarely considered.[211]

In some contexts, climate changes create conditions that make Indigenous women more vulnerable to violence and injustice. In Uganda, Indigenous men have been forced to work longer distances from home, increasing the risk of sexual violence against local Indigenous women and girls and undermining the sense of security within communities.[212] Indigenous women in the fishery workforce continue to be paid less than their male counterparts and in some cases are still "invisible", compelling many of them to seek employment in urban areas, where they face further stigma, discrimination, and labour exploitation.[213] Indigenous women and girls are "not vulnerable by nature" but are arguably placed in situations of vulnerability due to discrimination based on gender, ethnicity, and socioeconomic status.[214] The systematic lack of respect for women's individual right to self-determination and their collective right to remain connected to their lands, territories, and natural resources create challenges that are exacerbated by climate change.[215]

2.4. Opportunities for responding to climate change in ways that advance Indigenous health and well-being

2.4.1 The strength and adaptive capacity of Indigenous knowledges

Potential responses to climate-related impacts that can improve Indigenous Peoples' health and well-being are wide-ranging and include "mechanical" responses (such as enhanced monitoring/surveillance and warning systems),[216] regulatory responses[217] (such as land-use policies and conservation legislation),[218] and research responses.

The value of engaging multiple forms of knowledge in responding to climate change is widely recognized. Engagement with knowledge systems beyond the Western model can deepen and broaden understandings of climate-health impacts and can "improve [the] quality of evidence about co-impact"[219] through the collection of "more responsive and representative data".[220]

While the speed at which ecosystem and human-environment changes are occurring presents challenges with regard to traditional knowledge, its adaptive capacity must be recognized. Embedded in many Indigenous knowledge systems is the ability to adapt to environmental changes, and Indigenous knowledge itself can be considered a "determinant of adaptability/

211 Philippine Sutz, Emilie Beauchamp and Anna Bolin, "Routes to change: rural women's voices in land, climate and market governance in sub-Saharan Africa", project report (London, 2021), available at https://www.iied.org/20331iied.
212 Neufeld, Nilsson and Jones, "Indigenous Peoples' health and well-being in a changing climate".
213 United Nations, Human Rights Council, "Indigenous women and the development, application, preservation and transmission of scientific and technical knowledge"; Food and Agriculture Organization of the United Nations, *Indigenous Peoples, Afro-Descendants and Climate Change in Latin America – Ten Scalable Experiences of Intercultural Collaboration* (Santiago, 2021), available at https://doi.org/10.4060/cb4847en.
214 Food and Agriculture Organization of the United Nations, *Indigenous Peoples, Afro-Descendants and Climate Change in Latin America – Ten Scalable Experiences of Intercultural Collaboration*, p. 31.
215 Ibid.
216 Hagen and others, "Climate change-related risks and adaptation potential in Central and South America during the 21st century".
217 Charnley, Ilan Kelman and Kris A. Murray, "Drought-related cholera outbreaks in Africa and the implications for climate change: a narrative review".
218 Gupta, Nishi and Gasparatos, "Community-based responses for tackling environmental and socio-economic change and impacts in mountain social–ecological systems".
219 Jones, Macmillan and Reid, "Climate change mitigation policies and co-impacts on Indigenous health: a scoping review", p. 14.
220 Van Bavel and others, "Contributions of scale: what we stand to gain from Indigenous and local inclusion in climate and health monitoring and surveillance systems", p. 17.

resilience" to climate change and other environmental shifts.[221] As the land is a place for learning how to thrive, restoring communal bonds, and becoming holistically healthier, traditional knowledge underpins the adaptive capacity of Indigenous communities. In one review, Indigenous youth report that their knowledge of and connection to the land fosters healthy habits and discourages unhealthy practices such as substance misuse.[222] There is a need to both support community-led adaptation and address broader sociopolitical constraints on community-determined responses. Intergenerational knowledge transfer is central to adaptation responses where communities engage in traditional land-based practices. Ecosystems have always been in flux to some extent; "adaptation to environmental change is a constant" in the lives of Indigenous Peoples, "and they will continue to adapt".[223]

2.4.2 The importance of localized, Indigenous-led action for climate change adaptation

While national, regional and international solutions can be beneficial, community-led responses to climate change and biodiversity loss tend to be the most effective, as they are better aligned with local normative values and principles. Localized approaches may involve community-driven responses,[224] strengthened community engagement,[225] community-centred discourse, or bottom-up approaches such as community-based monitoring.[226] The voices and untold stories of Indigenous Peoples are key to these community-driven responses, as they enrich and expand the knowledge base within the community and can also be integrated in broader national or global responses to climate change and initiatives aimed at strengthening Indigenous inclusion. In Australia, "Aboriginal and Torres Strait Islander knowledges are being applied in Caring for Country initiatives that have a multitude of social, cultural, economic and health co-benefits beyond positive environmental outcomes".[227]

2.4.3 The future of research on climate change and the health and well-being of Indigenous Peoples

Future approaches to climate-health research need to be interdisciplinary, transdisciplinary, and strengths-based and incorporate a broader conceptualization of health that better reflects Indigenous Peoples' concepts of health and well-being. Research responses to climate-health impacts need to engage with the complexity of socioecological relationships. One Health, ecosystem-based adaptation, and nature-based solutions can serve as useful frameworks for inquiry with these embedded systems and Indigenous relationality, as they offer ecocentric perspectives that can inform the design and development of adaptation approaches and support further exploration of the interfacing or integration of Indigenous knowledge systems with Western science frameworks or models. Clifton Cottrell has suggested that nature-based thinking – focused on the intrinsic value of nature and the establishment of a more inclusive and expansive framework for climate response – could help bridge the divide between the Western and Indigenous scientific communities. He notes that practitioners of nature-based solutions are well-positioned to "support the sovereignty of Indigenous Peoples by advocating for local management and control over project lands".[228] This is echoed in the report of the twenty-second session of the United Nations Permanent Forum on Indigenous Issues,[229] which emphasizes that Indigenous Peoples represent a vital resource for societies and Governments,

221 Ford and others, "Mapping human dimensions of climate change research in the Canadian Arctic", p. 816.

222 Lebel and others, "Climate change and Indigenous mental health in the circumpolar North: a systematic review to inform clinical practice".

223 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere".

224 Anna Schlingmann and others, "Global patterns of adaptation to climate change by Indigenous Peoples and local communities: a systematic review", *Current Opinion in Environmental Sustainability*, vol. 51 (August 2021), p. 56, available at https://doi.org/10.1016/j.cosust.2021.03.002.

225 Lam and others, "Community-based monitoring of Indigenous food security in a changing climate: global trends and future directions".

226 Ibid.; Kipp and others, "The need for community-led, integrated and innovative monitoring programmes when responding to the health impacts of climate change".

227 HEAL Network and CRE-STRIDE, "Climate change and Aboriginal and Torres Strait Islander health: discussion paper", p. 15.

228 Clifton Cottrell, "Avoiding a new era in biopiracy: including Indigenous and local knowledge in nature-based solutions to climate change", *Environment Science & Policy*, vol. 135 (September 2022), p. 167, available at https://doi.org/10.1016/j.envsci.2022.05.003.

229 United Nations Permanent Forum on Indigenous Issues, "Indigenous determinants of health in the 2030 Agenda for Sustainable Development".

as they are ideally positioned to promote environmental awareness and protection and the utilization of safe and effective global healing traditions. Strengths-based research can affirm the efficacy of Indigenous solutions, with effective practices integrated into official human and environmental health frameworks, as seen in New Zealand and in parts of the United States of America and Australia.[230] The formal incorporation of Indigenous approaches in Australian wildfire mitigation policies has yet to occur owing to the bureaucratic dismissal of Indigenous practices due to what is perceived to be a lack of evidence.[231] Alternative strategies are being pursued to create a seasonal calendar that integrates traditional fire regimes. After a decade of advocacy, traditional fire practices have received scientific acceptance in the Northern Territory, where they will become part of carbon abatement strategies aimed at reducing the intensity and frequency of bush fires, which account for approximately half of the Territory's greenhouse gas emissions.

A number of studies emphasize the importance of carrying out primary research in direct partnership with Indigenous Peoples.[232] Rhys Jones, Alexandra Macmillan and Papaarangi Reid argue that "despite the complexity of this field of research, it is possible to improve the quality of evidence about co-impacts on Indigenous health in order to inform pro-equity climate mitigation. This will require partnership with Indigenous communities, recognition and privileging of Indigenous knowledges, and study design that fully embeds Indigenous values, realities and priorities. Fundamentally, [the] sharing of power … in the research process and in the conception, design and implementation of climate change policy and interventions will be essential for Indigenous rights and health equity."[233] Diverse methodological approaches should be employed to ensure that research processes and outcomes involve a bilateral sharing of information rather than the Western scientific community "providing unilateral advice".[234]

Even when Indigenous approaches are supported by research evidence, navigating knowledge-sharing partnerships can be challenging. A recent report from New Zealand suggests that Māori values and principles remain on the periphery of health policy and practice. While there appears to be a high commitment to engagement with Māori in health policy, the understanding of Māori values and principles is often superficial.[235] Consequently, their knowledge is undervalued and its application often tokenistic. It is imperative to keep in mind when incorporating Indigenous principles and knowledge outside Indigenous contexts that ethical protocols and safeguards need to be followed, and any agreements concluded need to adhere to the principle of free, prior and informed consent recognized in the United Nations Declaration on the Rights of Indigenous Peoples.

2.4.4 Shifting the narrative towards community-driven rights-based approaches that emphasize Indigenous Peoples' sovereignty and autonomy

Advancing priorities and processes related to Indigenous Peoples' sovereignty, rights and autonomy within the climate-health space is crucial. The need to prioritize and respect Indigenous Peoples' sovereignty and autonomy within climate-adaptation efforts (whether related to food systems, health systems, or monitoring and surveillance systems) is recognized; however, as indicated in research undertaken by Bianca van Bavel and others, there persists "an ethical practice gap in the recognition

230 Ibid.
231 HEAL Network and CRE-STRIDE, "Climate change and Aboriginal and Torres Strait Islander health: discussion paper", p. 26.
232 Examples include Akearok and others, "Identifying and achieving consensus on health-related indicators of climate change in Nunavut"; Gupta, Nishi and Gasparatos, "Community-based responses for tackling environmental and socio-economic change and impacts in mountain social-ecological systems"; Loring and Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)"; Ford and others, "Vulnerability of Aboriginal health systems in Canada to climate change"; Borish and others, "Relationships between *Rangifer* and Indigenous well-being in the North American Arctic and subarctic: a review based on the academic published literature".
233 Jones, Macmillan and Reid, "Climate change mitigation policies and co-impacts on Indigenous health: a scoping review", p. 14; Zimmermann and others, "A leverage points perspective on Arctic Indigenous food systems research: a systematic review".
234 Eerkes-Medrano and Huntington, "Untold stories: Indigenous knowledge beyond the changing Arctic cryosphere", p. 6.
235 Awatere and others, "He huringa āhuarangi, he huringa ao: a changing climate, a changing world".

and actualization of Indigenous and local autonomy, intellectual property rights, and data sovereignty in integrated monitoring and surveillance systems".[236]

The need to recognize and actualize autonomy extends to the research and policy spheres, where various reviews affirm the dearth of approaches that are rights-based. Philip Loring and S. Craig Gerlach note that "even the ability to define the problem on one's own terms represents in many places a move away from the status quo".[237] A focus on rights within policy responses would be reflected in provisions supporting "greater Indigenous autonomy over mobility, time, education and land use"[238] and would signify "a new ethos of coordination and cooperation among government levels" to address institutional determinants of health.[239] Loring and Gerlach underscore the "need to see beyond past concepts such as adaptation and resilience and look instead to rights-based reform".[240] In responding to climate and environmental changes, the locations of power need to be urged to move towards a model of equitable and shared decision-making that supports Indigenous Peoples' sovereignty, rights and autonomy. Those in power must be asked important questions about who gets to speak in the climate policy discourse, who they are speaking for, who is missing at the policy table, and why Indigenous voices are not being heard right now given the urgency of climate change challenges.

2.5 Conclusion and recommendations

The findings and observations shared in this chapter are threaded together by one central theme: climate-health impacts are rooted in and inseparable from Indigenous Peoples' connections to place. Location-specific environmental changes and biodiversity loss are driving unprecedented proximal, intermediate and distal changes to Indigenous health and well-being. Examples have been provided of aquatic, atmospheric and terrestrial changes across diverse geographic areas and cryospheric changes across Arctic and subarctic regions. Broadly speaking, ecosystem changes derive from climate effects related to water, air and land (such as precipitation changes, temperature changes and erosion). These shifts are linked to changes in the relationships between living organisms and their physical environment across geographies, affecting many of the plants and much of the wildlife essential to Indigenous Peoples' food systems, medicines, and livelihoods. Among other things, Indigenous communities have been negatively affected by the climate-driven encroachment of invasive species and changes in the health and productivity of agrobiodiverse crops. Overall, human activities and broader climatic and environmental shifts have been identified as key drivers of ecosystem and biodiversity changes.

There is broad acknowledgement of the value of engaging multiple forms of knowledge (rather than relying solely on Western knowledge) in responding to climate change, as this approach can deepen the overall understanding of the impacts of climate and other environmental changes on health and well-being. Indigenous knowledge should occupy a key position within this narrative, and the keepers of this knowledge should be actively involved in monitoring and combating climate change. It is important that responses to climate change and biodiversity loss are carried out primarily at the community level, where the alignment of solutions with local normative values and principles is strongest.

Advancing priorities and processes related to Indigenous sovereignty, rights, and autonomy within the climate-health space is crucial, as is promoting recognition of and respect for Indigenous sovereignty and autonomy in climate-adaptation efforts, whether related to food

236 Van Bavel and others, "Contributions of scale: what we stand to gain from Indigenous and local inclusion in climate and health monitoring and surveillance systems".
237 Loring and Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)".
238 Davis and others, "Shifting safeties and mobilites on the land in Arctic North America: a systematic approach to identifying the root causes of disaster", p. 15.
239 Ford and others, "Vulnerability of Aboriginal health systems in Canada to climate change", p. 677.
240 Loring and Gerlach, "Searching for progress on food security in the North American north: a research synthesis and meta-analysis of the peer-reviewed literature + supplementary appendix (see article tools)", p. 387.

and water systems, health systems, or monitoring and surveillance systems.

This chapter has highlighted opportunities for advancing Indigenous health and well-being in the context of climate and environmental change and has offered suggestions for future research, policies, and programming. Specific recommendations are as follows:

- Recognize, centre and engage non-Western knowledge systems and values in climate science to support climate change adaptation and deepen the overall understanding of climate-health impacts.
- Continue to fund, platform and otherwise support localized, community-led adaptation to climate change while also addressing broader sociopolitical constraints to Indigenous Peoples' community-based self-determination and leadership.
- Target responses towards broader health and well-being challenges to buffer the impacts of climate and environmental change on the health and well-being of Indigenous Peoples.
- Shift the narrative around climate-health adaptation from community-based approaches to community-driven, rights-based approaches that emphasize Indigenous sovereignty and autonomy.
- Consider adopting a Health in All Policies approach in rural and urban development planning so that policies and programmes across sectors account for climate change and its impacts on the health and well-being of Indigenous Peoples.
- Ensure that all relevant health topics and areas are integrated in policymaking, programming, and monitoring and evaluation in order to mainstream a cross-cutting focus on Indigenous health and climate change.
- Apply a wider lens and broader conceptualization of health that better reflects the multidimensional and diverse Indigenous conceptions of Indigenous health and well-being.
- Consider health, well-being, and key determinants of health as addressed by the United Nations Declaration on the Rights of Indigenous Peoples and the fortifying nature of these rights.
- Address topical, linguistic, and geographical gaps in published, peer-reviewed secondary literature that examines the health and well-being of urban Indigenous Peoples and explores the gendered impacts of climate change on Indigenous Peoples' health and well-being.

This chapter supports the assertion that the world is at an ecological and relational tipping point.[241] As mentioned, climate change and biodiversity loss are directly related to the perpetuation of colonial strategies, policies, practices and systems (including legal and judicial processes). In exploring and addressing Indigenous health and well-being, particularly in connection with autonomy, self-determination and sovereignty, it is critical to establish a framework on Indigenous determinants of health as well as pathways towards decolonization involving a vital repositioning of human engagement with the land and environment that takes into account Indigenous conceptualizations of health and well-being. A study by a Member of the UN permanent Forum has proposed a framework on Indigenous determinants of health to guide Governments and international organizations in developing strategies, policies and initiatives linked to Sustainable Development Goals aimed at eliminating poverty, strengthening equality and improving health for all populations.[242] This framework offers Member States guidance on advancing the human rights standards and fundamental freedoms enshrined in the United Nations Declaration on the Rights of Indigenous Peoples. In the discourse on Indigenous health and well-being, including the determination of factors that influence or impact Indigenous health, the strengths and wisdom inherent in Indigenous identities must be seen as intrinsically connected with everything on the planet for all time. Essentially, the health and well-being of Indigenous Peoples is linked to the lives of those who came before them and, perhaps most critically (within the context of climate change), the lives of future generations.

241 Jones, Macmillan and Reid, "Climate change mitigation policies and co-impacts on Indigenous health: a scoping review".
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Dog Sledding in Uummannaq, Greenland.
Credit: UN Photo/ Mark Garten

Chapter 3 - Lands, Territories, Environment and Resources

Chapter 3: Lands, Territories, Environment and Resources

3.1 Introduction

Indigenous Peoples are among the best environmental stewards, but they are being disproportionately affected by the climate crisis, and many of their lands and territories have become "sacrifice zones" or have been subjected to greenwashing and a multitude of other false solutions implemented in their areas by corporations and Governments. More frequent and severe natural disasters are impacting marine, terrestrial and cryosphere ecosystems, driving Indigenous Peoples from their homes, causing economic and livelihood losses, and forcing changes to cultural practices. Renewable energy initiatives often violate Indigenous Peoples' human rights. Deep sea mining, dams, and other large infrastructure projects can displace Indigenous Peoples from their lands and territories and have other detrimental impacts. Solar panels and wind turbines create toxic environmental land, water, and air pollution when disposed of, and there are profound negative consequences from nuclear energy and geoengineering.[243]

In the report of its twenty-second session, held in April 2023, the United Nations Permanent Forum on Indigenous Issues highlights the urgent need to advance the full participation of Indigenous Peoples in the development of plans and policies to address climate change to ensure that Indigenous knowledge of land management and natural resource stewardship is incorporated in relevant discussions and negotiations. The Forum emphasizes that the principle of free, prior and informed consent must be observed in all climate change policy processes and initiatives. The report notes that Indigenous Peoples are not opposed to the development of renewable energy sources but are alarmed at the continued expansion in the implementation of green-technology and green-transition projects and activities – particularly hydroelectric dams and initiatives associated with critical mineral extraction – that have led to violations of Indigenous Peoples' rights. In the report, the Permanent Forum also mentions the infringement of Indigenous rights in the establishment of protected areas and conservation measures without the free, prior and informed consent of Indigenous Peoples.[244]

For Indigenous Peoples' communities, these and other concerns signal the potentially devastating impacts not only of climate change itself (given their direct dependence on their ancestral territories and a healthy environment for their subsistence, survival, culture and identity), but also of climate change adaptation and mitigation actions that do not benefit them and are being undertaken without their participation or free, prior and informed consent.

While the full recognition and implementation of Indigenous rights have yet to be achieved, many of these rights are progressively being respected and enforced under international law, particularly in the African and the Inter-American human rights systems. Indigenous Peoples and their allies are effectively advocating for change towards rights-based approaches by Governments, financial institutions, donor organizations, intergovernmental organizations, environmental non-governmental organizations, and private sector actors. At the national and regional levels, growing numbers of Indigenous Peoples are filing court cases to demand that their internationally recognized rights be respected. This offers hope for a just way forward in the struggle for respect for the dignity of humanity and nature and for a progressive shift away from the destructive route of

243 United Nations, Department of Economic and Social Affairs, "Concept note – State of the World's Indigenous Peoples, Volume 6: Climate Crisis", internal document (January 2023).

244 United Nations, Economic and Social Council, "Permanent Forum on Indigenous Issues: report on the twenty-second session (17-28 April 2023)", *Official Records, 2023, Supplement No. 23* (E/2023/43-E/C.19/2023/7), paras. 44-46, available at https://documents.un.org/doc/undoc/ltd/n23/127/22/pdf/n2312722.pdf?OpenElement.

the modern industrial world and its focus on individual economic gains and interests.

The present chapter provides an overview of key environmental issues and processes that are of vital importance and relevance to Indigenous Peoples, as they are inextricably linked to their self-determination, human rights, identity, dignity, well-being, and continued existence. The chapter examines processes that can be detrimental to Indigenous Peoples and the urgent need for meaningful recognition and enforcement of their rights, including those linked to preserving the health and integrity of their ancestral territories. The first part of the chapter focuses on the adoption of various climate change adaptation and mitigation measures (including false solutions) that are having negative impacts on Indigenous Peoples and their traditional knowledge, languages, ecosystems and health. The chapter then offers some exemplary case studies and closes with a set of strategic considerations and recommendations, including the potential increased use of legal options.

3.2 In the name of the environment and climate change....

In the name of protecting the environment and mitigating climate change, entire communities are being expelled from their ancestral lands and are often forbidden to use those lands for their survival. In a 2022 report to the Secretary-General of the United Nations, the Special Rapporteur on the rights of Indigenous Peoples relates that the "exclusionary approach to protecting biodiversity known as 'fortress conservation' continues to prevail and has led to violent evictions, militarized violence and the dispossession of the lands of Indigenous Peoples".[245] He notes that "protected areas are often created without consulting or obtaining the free, prior and informed consent of Indigenous Peoples, who are then excluded from the administration and management of their traditional territories and are often left without adequate compensation. Indigenous Peoples are, in some cases, required to purchase permits to enter their territories and face severe restrictions on their subsistence livelihood activities, such as hunting, fishing or grazing".[246] The Special Rapporteur references cases from countries around the globe illustrating human rights violations against Indigenous Peoples related to the establishment of protected areas. These situations often occur in connection with, for example, the suggested inclusion of particular areas on the UNESCO World Heritage List, actions related to the REDD+ mechanism,[247] or biodiversity conservation efforts aligned with the provisions of the United Nations Convention on Biological Diversity or the United Nations Framework Convention on Climate Change. The 2022 report highlights specific threats to Indigenous communities, as follows:

> **The Special Rapporteur continues to receive a high number of communications with allegations of alarming violations in protected areas. Indigenous Peoples are denied their rights to land and resources, self-determination and autonomy, and cultural heritage, and suffer from forced evictions, killings, physical violence and abusive prosecution. Such violations have had particularly negative impacts on Indigenous women and girls, who are primarily responsible for gathering food, fuel, water and medicine and are therefore exposed to risks of sexual violence at the hands of militarized security forces, park rangers and law enforcement. The ability of Indigenous Peoples to maintain and transmit their knowledge is also impeded by limited access to natural resources and sacred sites.**

The placement of Indigenous lands under the control of government conservation authorities has highlighted the lack of capacity and political will to safeguard such areas effectively. Rather than protecting these

245 United Nations, "Rights of Indigenous Peoples", note by the Secretary-General, transmitting the "Report of the Special Rapporteur on the rights of Indigenous Peoples, José Francisco Calí Tzay – protected areas and Indigenous Peoples' rights: the obligations of States and international organizations", 19 July 2022 (A/77/238), paras. 18 and 20, available at https://www.ohchr.org/en/documents/thematic-reports/a77238-protected-areas-and-indigenous-peoples-rights-obligations-states.

246 Ibid., para. 22.

247 REDD+ is a voluntary climate change mitigation approach that has been developed by Parties to the United Nations Framework Convention on Climate Change. It aims to incentivize developing countries to reduce emissions from deforestation and forest degradation, conserve and enhance forest carbon stocks, and sustainably manage forests.

lands, Governments have exposed them to destructive incursions, the activities of extractive industries, illegal logging, agribusiness expansion, tourism, and large-scale infrastructure development.

Indigenous Peoples all over the world are witnessing land and resource grabbing, greenwashing, carbon-capture-related financial schemes, so-called nature-based approaches, bioeconomy and net-zero initiatives, and various other purported solutions to climate change that have led to disempowerment, abuses of trust, and the weakening or upending of traditional governance systems and decision-making processes. These false solutions all take a market-based approach to reducing greenhouse gas emissions and mitigating the storage of carbon in forests and waters. Carbon stored in trees and water bodies has become a commodity that can be bought and sold, but this fails to address the underlying causes of climate change, effectively delaying rather than accelerating the implementation of genuine remedial action. On paper, and in their calculations of carbon debt, countries and companies show that they have "offset" their emissions, whereas in reality they have only paid for existing carbon storage but have continued to release their greenhouse gases into the atmosphere.

A 2023 report on environmental, social and governance risks for the public and private sectors indicates that "a growing number of both public and private companies have been linked to misleading communication around environmental issues. Greenwashing risk has accelerated in Europe and the Americas, with the banking and financial services sectors particularly exposed."[248] While somewhat less pervasive, "social washing" often goes hand in hand with greenwashing, occurring when companies paint themselves in a positive light by obscuring an underlying social issue (such as failing to obtain free, prior and informed consent) in an effort to safeguard their reputation and financial performance.[249]

A 2023 study evaluating the effectiveness of REDD+ carbon credit projects in reducing deforestation, generating high-quality carbon credits, and protecting forest communities found that "current REDD+ methodologies likely generate credits that represent a small fraction of their claimed climate benefit" and that "safeguard policies, presented as ensuring 'no net harm' to forest communities, in practice have been treated as voluntary guidance".[250] A Berkeley Carbon Trading Project study, also from 2023, concludes that carbon credit calculations are overly generous and that "social safeguard policies and outcomes could be more stringent".[251]

Recognizing that greenwashing and social washing in advertising and marketing could potentially mislead the public, the European Parliament and the Council of the European Union reached a provisional agreement in September 2023 on new rules banning advertisements that make "generic environmental claims" or "claims based on emissions offsetting schemes that a product has neutral, reduced or positive impact on the environment".[252]

In spite of the many solemnly concluded environmental commitments and agreements in place, millions of people are being sacrificed to environmental pollution. In a 2022 report to the Human Rights Council, the United Nations Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment states that "pollution and toxic substances cause at least 9 million premature deaths" annually and that "one in six deaths in the world involves diseases caused by pollution". He notes that there are growing numbers of "sacrifice zones"

248 RepRisk, "On the rise: navigating the wave of greenwashing and social washing" (October 2023), available at https://www.reprisk.com/news-research/reports/on-the-rise-navigating-the-wave-of-greenwashing-and-social-washing.
249 Ibid.
250 Berkeley Public Policy, The Goldman School, "Reducing emissions from deforestation and forest degradation (REDD+) carbon crediting", available at https://gspp.berkeley.edu/research-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/redd.
251 Gilles Dufrasne, "Quality assessment of REDD+ carbon credit projects" (Carbon Market Watch, 15 September 2023), available at https://carbonmarketwatch.org/publications/quality-assessment-of-redd-carbon-credit-projects/.
252 European Parliament, "EU to ban greenwashing and improve consumer information on product durability", press release, 19 September 2023, available at https://www.europarl.europa.eu/news/en/press-room/20230918IPR05412/eu-to-ban-greenwashing-and-improve-consumer-information-on-product-durability.

Rangeland restoration in Masai communities in Tanzania.
Credit: Phil Kabuje/UNDP Tanzania

in which communities suffer from extreme exposure to pollution and dangerous substances.[253]

In a separate report published in 2022, the United Nations Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes observes that "mining, oil and gas exploration and extraction, spraying of toxic pesticides, dumping of hazardous wastes, and military activities have appalling effects on the rights of Indigenous Peoples. Every aspect of Indigenous Peoples' lives is affected by the contamination of their bodies, lands, waters, food, wildlife and plants." The report contains recommendations aimed at addressing the adverse consequences of toxic substances on Indigenous peoples, including suggestions on how legal instruments relating to chemicals and wastes should be interpreted in the light of United Nations Declaration on the Rights of Indigenous Peoples.[254]

Mercury is widely used in the gold mining industry, particularly by small-scale gold miners such as the *garimpos/garimpeiros* in South America. The harmful effects of this naturally occurring heavy metal and of activities involving its use are well documented. Estimates from various sources indicate that "during 2020, the gold rush destroyed some 114 square kilometers of the Brazilian Amazon, the equivalent of 10,000 soccer fields. This represents the largest annual area since records have been kept." It is noted that "the bulk of this destruction occurs in Indigenous reserves, where the gold miners install their mines and heavy machinery, … attack villages, transmit diseases, contaminate water and devastate communities whose knowledge and respect for nature are essential".[255]

Similar studies in other regions, including the Arctic,[256] also describe the impacts of mining and the use of mercury on humans and nature.

The 2013 Minamata Convention on Mercury, which entered into force in 2017, explicitly acknowledges the negative effects of mercury on Indigenous foods and Indigenous communities in general.[257] The Convention secretariat recently launched the Indigenous Peoples Platform of the Minamata Convention on Mercury to promote Indigenous involvement in combating mercury pollution. Through this Platform, Indigenous Peoples can participate in the development and implementation of national action plans to address the use of mercury in artisanal and small-scale gold mining, as this constitutes the single greatest human-induced source of global mercury pollution, negatively impacting the health, culture and livelihoods of Indigenous Peoples who are employed in the mining sector or who live near mining sites.[258]

Although the forest-based gold seekers are commonly painted as the main destructive force, there are many other actors contributing directly or indirectly to the environmental destruction caused by gold mining. Luis Salas Rodríguez, Executive Director of the civil society organization Wataniba, which promotes sustainable Indigenous territorial management and capacity-strengthening, makes reference to a slew of less visible culprits, including (para)military forces who protect the gold miners (and often inflict their own harm) and corrupt businesspeople and politicians who instigate, allow or facilitate destructive mining and processing practices; on the demand side are central banks, buyers of jewellery, and gold investors, speculators and brokers. Salas Rodríguez cites data from the World Gold Council,

253 United Nations, Human Rights Council, "The right to a clean, healthy and sustainable environment: non-toxic environment", report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, 12 January 2022 (A/HRC/49/53), para. 5 and summary, available at https://undocs.org/en/a/hrc/49/53; see also Office of the United Nations High Commissioner for Human Rights, "Polluted planet: UN expert urges ambitious, urgent action to tackle human rights violations", press release, 10 March 2022 (Geneva), available at https://www.ohchr.org/en/press-releases/2022/03/polluted-planet-un-expert-urges-ambitious-urgent-action-tackle-human-rights.

254 United Nations, General Assembly, "Implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes", note by the Secretary-General, transmitting the "Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, Marcos Orellana: the impact of toxic substances on the human rights of Indigenous Peoples", 28 July 2022 (A/77/183), available at https://www.ohchr.org/en/documents/thematic-reports/a77183-impact-toxic-substances-human-rights-indigenous-peoples-report.

255 Luis Salas Rodríguez (for Debates Indígenas), "White-collar miners: Who is devastating the Amazon?", news, 1 November 2023 (Copenhagen, International Work Group for Indigenous Affairs), available at https://www.iwgia.org/en/news/5296-white-collar-miners-who-is-devastating-the-amazon.html.

256 Arctic Monitoring and Assessment Programme, *AMAP Assessment 2021: Mercury in the Arctic* (Tromsø, Norway, 2021), available at https://www.amap.no/documents/doc/amap-assessment-2021-mercury-in-the-arctic/3581.

257 United Nations Environment Programme, Minimata Convention on Mercury, "Platform for Indigenous Peoples and for local communities", available at https://minamataconvention.org/en/indigenous-peoples-platform.

258 Ibid.

which estimates that 46 per cent of the gold mined in the world is transformed into jewellery, more than 20 per cent is used for investment purposes, 17 per cent is held by central banks as reserves, and 15 per cent is used for other purposes.[259] The on-site *garimpeiros* do the dirty work, but behind them are "white collar *garimpeiros*" that also play a role harming the environment and the Indigenous communities living in the affected areas.[260]

Indigenous Peoples and their lands, territories and waters have not been spared the effects of other toxic pollutants or nuclear power plants and their waste products. In 2020, Joe Heath, General Counsel of the Onondaga Nation in Northern America, observed that "the entire life cycle of the nuclear power industry has huge negative impacts on Indigenous nations and Peoples, from the mining of uranium … and the vast amounts of nuclear waste associated with the mining and milling of uranium, to the transportation of uranium and the proposed long-term storage of nuclear wastes on Indian country". With three nuclear reactors that "are well past their designed life spans" located within Onondaga Nation territory, the potential dangers to the environment and people are serious.[261]

The foregoing illustrates how little has actually been achieved in addressing the impacts of climate change and other causes and effects of environmental degradation. In a 2022 report on the role of States and international organizations vis-à-vis protected areas and Indigenous rights, the Special Rapporteur on the rights of Indigenous Peoples relates the following:

> **The secretariat of the Convention on Biological Diversity and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services have demonstrated in their analysis that opportunities for effective action [on the implementation of the 20 Aichi Biodiversity Targets] have been missed owing to insufficient recognition and participation of Indigenous Peoples in conservation, and have recommended that stronger requirements for future action on biodiversity to address Indigenous Peoples' rights as a foundational prerequisite be set in the new global framework [being negotiated].[262]**

A 2020 review of 686 studies on the impacts of environmental pollution on Indigenous Peoples notes that despite the burdens being placed on them, Indigenous Peoples are still working to limit pollution and protect their areas through traditional stewardship practices, environmental monitoring, policy advocacy, local demonstrations and resistance, and other means. The review calls for the increased participation of Indigenous Peoples in environmental decision-making.[263]

3.3 Climate financing

When protected areas or forest reserves are established as part of carbon credit schemes, Indigenous Peoples are frequently removed from their territories and excluded from management plans and decision-making. In many cases, environmental damage to a protected area is not prevented because of "carbon leakage", where extractive industry activity is simply shifted from one carbon credit site to another. Carbon credit schemes offer Indigenous Peoples very little in the way of environmental or financial benefits. Governments, non-governmental organizations (NGOs), and other intermediaries often receive limited funding for short-term carbon projects that may not be focused on long-term sustainability. Indigenous Peoples receive a minute portion of the funding and profits, which are typically split among investors, banks, Governments and intermediaries, including some environmental and greenwashing NGOs. Such scenarios only divert Indigenous Peoples and their scarce human

259 World Gold Council, "Historical demand and supply", available at https://www.gold.org/goldhub/data/gold-demand-by-country.
260 Luis Salas Rodríguez, "Garimpeiros de cuello blanco: ¿quiénes devastan la Amazonía?" (Debates Indígenas, 1 October 2023), available at https://debatesindigenas.org/2023/10/01/garimpeiros-de-cuello-blanco-quienes-devastan-la-amazonia/.
261 Joe Heath, General Counsel of the Onondaga Nations, "The violence of nuclear energy against Indigenous Peoples, land, water and air", article, 19 August 2020 (Sierra Club, Atlantic Chapter), available at https://www.sierraclub.org/atlantic/blog/2020/08/violence-nuclear-energy-against-indigenous-peoples-land-water-and-air.
262 United Nations, General Assembly, "Rights of Indigenous Peoples" (A/77/238), para. 31; United Nations, General Assembly, "Rights of Indigenous Peoples", note by the Secretary-General, transmitting the "Report of the Special Rapporteur of the Human Rights Council on the rights of Indigenous Peoples, Victoria Tauli-Corpuz", 29 July 2016 (A/71/229), para. 51, available at https://documents.un.org/doc/undoc/gen/n16/241/09/pdf/n1624109.pdf.
263 Álvaro Fernández-Llamazares and others, "A state-of-the-art review of Indigenous Peoples and environmental pollution", *Integrated Environmental Assessment and Management*, vol. 16, No. 3 (2019), pp. 324-341, available at https://doi.org/10.1002/ieam.4239.

resources away from their long-term efforts to maintain or restore environmental sustainability and achieve self-determination.

Climate financing approaches identifying Indigenous Peoples as "beneficiaries" might be viewed as social washing or greenwashing. Various financing schemes have been developed over the past few years for "the vulnerable" or for the "caretakers of nature", with Governments, NGOs, intermediaries, and sometimes even Indigenous Peoples' organizations being invited to submit project proposals that will ostensibly benefit Indigenous Peoples in their role as guardians of the lands and environment.

Green solutions, nature-based solutions, bioeconomic activities, and other environmental initiatives can represent both an opportunity and a threat. Indigenous Peoples are not against climate finance but have emphasized the need to secure direct financing that can be channelled and allocated through their own legitimate and representative institutions. They require easily accessible project funding and financial and decision-making autonomy so that they can pursue self-determined objectives, which often include the strengthening of legal and practical protections and the self-management of their territories. While climate funding is available, it is rarely directly accessible to Indigenous Peoples – whether by design (where funds must be provided to and disbursed by Governments, for example) or because of other barriers. Distribution strategies sometimes incorporate unbreachable barriers that are structured in a way that prevents Indigenous Peoples from receiving funds directly or exercising control over their disposition. However, even when such a possibility exists, there may be obstacles that can make it difficult, if not impossible, to fulfil the requirements for direct funding access. Difficulties can range from complex legal and administrative requirements (particularly for community organizations or non-registered Indigenous entities such as traditional authorities) to practical barriers such as forms being issued in an unfamiliar language or the availability of documents and the submission of proposals only through online platforms. While understandable, another potential challenge is that project funders almost always require that certain standards be met before agreeing to finance community initiatives, so financing approval may be linked to proof of well-established accounting systems and the results of external audits. A consequence of all this is that intermediaries are still the modality most commonly used to direct funds to Indigenous Peoples. Intermediaries may be legitimate Indigenous Peoples' organizations, but there are also NGOs that simply "use" Indigenous communities to access climate finance. The sustainable benefits from intermediated projects will greatly depend on the capacity of Indigenous Peoples to ensure that the financed initiatives are fully focused on their own long-term and rights-based priorities rather than settling for a small fraction of the funding and having little to no say in how it is used.

In the realm of climate finance, the gap is growing between Indigenous Peoples (who rarely have direct access to project funding or decision-making power and are thus unable to address their needs or improve their circumstances) and governmental or non-governmental actors (that are also beneficiaries of the financed initiatives and generally have more say in fund allocation and project execution). This imbalance often derives from the historical marginalization of Indigenous Peoples and from their limited technical or financial expertise compared to that of the other parties involved, who are able to move faster and take better advantage of the financing and project benefits. When non-Indigenous actors are in charge of climate initiatives, efforts are more likely to be focused on expediting the adoption of governmental controls and restrictions over forests than on taking the time needed to develop free, prior and informed consent protocols with the Indigenous Peoples affected. On paper, many climate projects appear to be implemented with the involvement of Indigenous Peoples, but as they have little practical say in project design or execution, the results do not necessarily enhance environmental sustainability or produce the desired outcome of strengthened Indigenous territorial control and management.

"Green" projects implemented and controlled by Governments or intermediaries are often stopgap initiatives with no sustainable impact. Temporary, top-down, externally driven projects often have a limited scope and fail to establish or support the necessary enabling conditions for real, sustainable results. These conditions include a non-restrictive legal environment and the full authority of Indigenous Peoples to exercise

control over any decisions or actions that affect their lands, territories and resources.

3.4 A stronger role for Indigenous Peoples and enabling conditions that make this possible

Indigenous Peoples are often identified as vulnerable populations and as victims of climate change (and even of ill-designed adaptation and mitigation efforts). While these labels may reflect the circumstances of Indigenous Peoples, they do not define them. Indigenous Peoples have viable climate change solutions and can meaningfully contribute to adaptation and mitigation efforts. The value of their extensive knowledge and experience is increasingly being recognized and integrated into the climate change strategies and activities of many development actors, finance and research institutes, and NGOs.

As highlighted throughout this report, Indigenous Peoples have an intimate relationship with and understanding of nature. They have observed and interpreted weather phenomena and climatic changes in their ancestral territories for centuries, acquiring time-tested empirical knowledge that has been passed down through successive generations. The data that have been accumulated and shared reflect a deep knowledge of environmental patterns and the ability to adapt to changes as needed. Indigenous knowledge systems are being increasingly recognized and embraced by Western science practitioners. The more recent reports of the Intergovernmental Panel on Climate Change have placed growing emphasis on the important role and potential of Indigenous knowledge in combating, adapting to, and mitigating climate change.[264]

With their ancient customs and traditions and their deep knowledge of the local environment, Indigenous Peoples have increasingly been involved in designing climate solutions, as exemplified in the subsections below.[265]

3.4.1 Guyana and REDD+

Guyana was an early participant in carbon credit schemes, being the first developing country to sign a formal agreement for financial assistance from a developed country when it requested the support of Norway in the implementation of its 2009 low-carbon development strategy (LCDS), which grew out of its 2007 vision for forest action. Under the terms of the agreement, Norway committed to providing Guyana up to $250 million for avoided deforestation, with the final amount contingent upon the delivery of results as measured against indicators of enabling activities and REDD+ performance.[266] The following details were provided in a joint statement issued by the Architecture for REDD+ Transactions (ART) secretariat and the Government of Guyana:

> Guyana committed to maintain the country's 18 million hectares of forests, sustain one of the world's lowest deforestation rates, store in excess of 19 gigatons of carbon dioxide equivalent and remove over 150 million tons of carbon per annum. In return, Guyana would be paid for these services and invest the revenues in the LCDS. From 2010 [to] 2015, Norway paid Guyana $220 million for forest climate services; these revenues were invested in renewable energy, job creation, land titling, the creation of jobs, and protecting citizens, farms and business[es] from flooding.[267]

Guyana was also the first to be issued jurisdictional carbon credits in compliance with the second version of the REDD+ Environmental Excellence Standard (TREES

264 "Indigenous, local and traditional knowledge systems and practices, including Indigenous Peoples' holistic view of community and environment, are a major resource for adapting to climate change. … Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation." (Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report – Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, core writing team, Rajendra K. Pachauri and Leo A. Meyer, eds. (Geneva, 2014), p. 19, available at https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf.

265 The cases mentioned here are examples of present-day practices relating to the topic of this report. Their mention here does not constitute endorsement or disapproval of these cases.

266 Guyana, Low Carbon Development Strategy, "Guyana-Norway partnership", available at https://lcds.gov.gy/guyana-norway-partnership/.

267 Guyana, Low Carbon Development Strategy, "Joint statement: Government of Guyana and Architecture for REDD+ Transaction (ART) secretariat", 8 December 2022, available at https://lcds.gov.gy/joint-statement-government-of-guyana-and-architecture-for-redd-transaction-art-secretariat/.

2.0), which is the ART standard for the "quantification, monitoring, reporting and verification of greenhouse gas (GHG) emission reductions and removals from REDD+ activities at a jurisdictional and national scale". In December 2022, these credits were purchased by the Hess Corporation, an energy company involved in the extraction of crude oil off the coast of Guyana.[268]

Hess is paying for about 30 per cent of the country's carbon credits. By the end of 2030, Guyana should have received at least $750 million from this deal. The national LCDS stipulates that 15 per cent of the amount collected is to be disbursed directly to Indigenous Peoples. A total of 238 of the country's 242 Indigenous communities have benefited from the $22 million (about GY$4.7 billion)[269] already paid out by the company. Each community has received funds ranging between GY$10 million (approx. $47,500) and GY$35 million (approx. $166,500) from the first set of carbon payments from the Hess Corporation.[270] Through an opt-in mechanism, Indigenous communities in Guyana can participate in the national level REDD+ payment programme by committing their forests to a REDD+ agreement. In return for limiting deforestation, they receive a pro rata share of the forest compensation payments.[271]

This arrangement is characterized by upsides and downsides, some of which are summarized below.

THE GUYANA CARBON CREDIT SCHEME

Upsides

- The Guyana carbon credit arrangement shows how a country's hard work and sustained commitment to keep deforestation levels verifiably low and provide forest-related environmental services can bring in significant financial flows.
- Guyana offers a rare example of payments for avoided deforestation and environmental services flowing directly to Indigenous communities on a pro rata basis.
- The country has been able to deal with the complex mechanisms in place for receiving international funding, including through the World Bank and United Nations agencies.
- To create enabling conditions for international (financial) support of this low-carbon pathway, successful efforts have been undertaken to broaden the compliance of Guyana with relevant agreements and standards. Among other things, Guyana has developed strong monitoring, reporting and verification mechanisms; it has concluded an agreement with the European Union to promote the sustainable trade of legal timber (a voluntary partnership agreement on forest law enforcement, governance and trade); and it has become part of the Extractive Industries Transparency Initiative, which promotes the open and accountable management of oil, gas and mineral resources.

Downsides

- There is a question about whether the rate of deforestation is low because of the carbon credit scheme or because it was always low (and thus not linked to remedial action under the scheme).
- There is also some question about whether the 2015 oil and gas finds in the territorial waters of Guyana have been the main reason for not utilizing the forests more intensively – though it should be noted that oil and gas industry activities may lead to increased deforestation.[272]
- The reference level for deforestation was set much higher than the normal deforestation rate for Guyana, making it possible for deforestation to continue at the usual pace and still remain under the target.[273] Norway disbursed the remaining balance from the pledged money despite the fact

268 Guyana, Low Carbon Development Strategy, "Guyana-Norway partnership".
269 GY$ = Guyanese dollars.
270 News Room, "Transformation ongoing as $2.6B carbon credit payments already dispersed to 238 Ingdigenous villages", article, 31 August 2023, available at https://newsroom.gy/2023/08/31/transformation-ongoing-as-2-6b-carbon-credit-payments-already-dispersed-to-238-indigenous-villages/.
271 World Wide Fund for Nature, "REDD+: REDD+ in Guyana", available at https://www.wwfguianas.org/our_work/programmes/redd/.
272 Vanessa Benn and others, *The Context of REDD+ in Guyana: Drivers, Agents and Institutions*, Occasional Paper, No. 201 (Bogor, Indonesia, Center for International Forestry Research, 2020), available at https://www.cifor-icraf.org/publications/pdf_files/OccPapers/OP-201.pdf.
273 Andrew Hook and Timothy Laing, "The politics and performativity of REDD+ reference levels: examining the Guyana-Norway agreement and its implications for 'offsetting' towards 'net zero'", *Environmental Science and Policy*, vol. 132 (June 2022), pp. 171-180, available at https://doi.org/10.1016/j.envsci.2022.02.021.

that Guyana had exceeded the adjusted reference level (or "floor") of 0.056 per cent during several years of the programme,[274] and in spite of the apparent unwillingness of the Government to address the damage done by mining, the main driver of deforestation.[275]

- The opt-in mechanism for payments to Indigenous Peoples was set up years after the payments were made to the Government. The mechanism comes with conditions and administrative burdens for the communities, and the funds and project implementation capacities are very limited, casting doubt on whether this programme is contributing meaningfully to long-term sustainable, self-determined development.
- There are some broader concerns about the readiness of Indigenous Peoples to carry out externally financed projects. As noted in a mid-term evaluation of community development plans and projects financed through the Amerindian Development Fund to support socioeconomic and environment development among Indigenous communities in Guyana, "insufficient community participation, understanding, buy-in and commitment have contributed to governance issues, together with the political changes due to elections and alternation between Village Council Toshaos and Councilors".[276] It has been questioned whether genuine, fully informed consent (based on a real understanding of both advantages and disadvantages) is being obtained from the Indigenous communities for proposed or approved initiatives. It should be noted that the principle of free, prior and informed consent is not protected for Indigenous communities that hold untitled forest lands.[277]
- The administrative burdens have been (and remain) heavy. Multilateral agencies still treat service agreements as international development finance arrangements.[278]
- One of the most criticized aspects of the Guyana LCDS and the various deals emanating from it has been the limited compliance or non-compliance with equally applicable international standards governing the rights of Indigenous Peoples. Among other things, not all Indigenous territories have been titled, and that process has stalled. The legislation governing the titling (the Amerindian Act 2006) fails to require that titling be based on customary land tenure systems or customary laws pertaining to land and resource ownership, as called for in international law. Land titling in Guyana is carried out on a village-by-village basis, resulting in the "villagization" of traditional lands that then become interspersed with titled land not held by Indigenous Peoples. Villages without titled land are not treated equally, and the Act allows for mining and logging concessions to be issued for untitled traditional lands without free, prior and informed consent.[279]
- The Government of Guyana has publicly attacked one of the country's main Indigenous Peoples' organizations,[280] raising the question of whether deepening historical discrimination and polarization against Indigenous Peoples is the price to be paid for environmental income and low carbon development.

274 Benn and others, *The Context of REDD+ in Guyana: Drivers, Agents and Institutions*.
275 Forest Peoples Programme and Amerindian Peoples' Association, *Indigenous Peoples' Rights, Forests and Climate Policies in Guyana: A Special Report* (2014), available at https://www.forestpeoples.org/en/topics/responsible-finance/publication/2014/indigenous-peoples-rights-and-climate-policies-guyana-sp.
276 Alejandro E. Rausch, "Mid-term evaluation – low carbon development strategy (LCDS) Amerindian Development Fund (ADF): Village Economy Development (Phase II) under the Guyana REDD+ Investment Fund (GRIF) (ADF Phase II Project)" (United Nations Development Programme, February 2017), p. 7, available at https://www.undp.org/latin-america/publications/mid-term-evaluation-low-carbon-development-strategy-lcds-amerindian-development-fund-adf-village-economy-development-phase.
277 Forest Peoples Programme and Amerindian Peoples' Association, *Indigenous Peoples' Rights, Forests and Climate Policies in Guyana: A Special Report.*
278 Benn and others, *The Context of REDD+ in Guyana: Drivers, Agents and Institutions.*
279 Forest Peoples Programme and Amerindian Peoples' Association, *Indigenous Peoples' Rights, Forests and Climate Policies in Guyana: A Special Report.*
280 Vickash Katwaru, "APA's motive of preventing the development of Amerindian villages is exposed", Guyana, Ministry of Parliamentary Affairs and Governance, blog post, 15 April 2023, available at https://mpag.gov.gy/%F0%9D%90%80%F0%9D%90%8F%F0%9D%90%80%F0%9D%90%AC-%F0%9D%90%8C%F0%9D%90%A8%F0%9D%90%AD%F0%9D%90%A2%F0%9D%90%AF%F0%9D%90%9E-%F0%9D%90%A8%F0%9D%90%9F-%F0%9D%90%8F%F0%9D%90%AB%F0%9D%90%9E/

3.4.2 The transfer of knowledge between Peru (water harvesting approaches) and Costa Rica (payment for ecosystem services)

Under a recent water sowing and harvesting and ecosystem services project,[281] Indigenous women associated with the Asociación Bartolomé Aripaylla (ABA) in Ayacucho, Peru, shared their ancestral water sowing and harvesting (*siembra y cosecha de agua*) knowledge with women and farmers in Costa Rica in exchange for knowledge relating to the latter's environmental services payment system. The communities in these countries have faced unprecedented drought conditions, and the project was set up to support vulnerable populations in Peru and Costa Rica in their efforts to adapt to the impacts of climate change. Magdalena Machaca, one of the ABA founders, explains why her local community has been involved in this initiative: "We know how to connect our emotions to get in touch with nature, become one with it. That's why, in the Quispillacta community (in the Ayacucho region), we are the guardians of water and we contribute to the preservation, harvesting and sustainable use of this resource."[282] Women from the ABA travelled to Guanacaste Province in Costa Rica, where they set about teaching local communities how to build water reservoirs. Through the concerted efforts of the local communities, local and national government authorities in Costa Rica, the coordinating NGO, and other project partners, five water reservoirs have been built so far with a total capacity of 35,000 m3.[283] In exchange for this transfer of knowledge and expertise, Costa Rica has provided Peru with information on the ecosystem services payment system it has in place.[284]

3.4.3 The potential use of human rights law and the international law of the sea to protect Arctic Indigenous Peoples against the impacts of climate change

According to the United Nations Environment Programme (UNEP) *Global Climate Litigation Report: 2023 Status Review*, the number of climate litigation cases more than doubled over a recent five-year period, increasing from 884 in 2017 to 2,180 in 2022. In the foreword to the Review, UNEP Law Division Director Patricia Kameri-Mbote notes that "children and youth, women's groups, local communities, and Indigenous Peoples, among others, are taking a prominent role in bringing these cases and driving climate change governance reform in more and more countries around the world".[285]

Although the results are pending at the time of writing, several climate change litigation cases in the European human rights system (along with decisions of the Inter-American human rights system) may provide an avenue for Indigenous Peoples in the Arctic and other regions to protect their local marine environments and livelihoods. In a 2023 article on the application of human rights law and the law of the sea to protect the livelihoods of Arctic Indigenous Peoples,[286] Lisa Mardikian and Sofia Galani analyse the potential benefits for Indigenous communities of legal appeals to the European Court of Human Rights, the Inter-American Commission on Human Rights, and the International Tribunal on the Law of the Sea (ITLOS). The use of human rights arguments and instruments for legal cases relating to climate change has not been widespread[287] but is on the rise.

281 The Water Sowing and Harvesting, Water Service Fee and Acknowledgement of Environmental Payment in the South-South Cooperation Framework in Peru and Costa Rica is part of the Forests, Biodiversity and Ecosystems component of the EUROCLIMA+ programme, which is financed by the European Union and jointly implemented by Expertise France and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The pilot project was implemented by the NGO Asociación para la Investigación y Desarrollo Integral (AIDER) and had an overall budget of 983,431 euros over an implementation period of two years (2019-2021), plus an extension period of 10 months. (EUROCLIMA, "Water sowing and harvesting & ecosystem services", available at https://www.euroclima.org/en/projects-forest/services-goods-and-ecosystem-functions.)

282 Expertise France, "Peru is passing on ancestral know-how to tackle climate change", article, 24 February 2020, available at https://www.expertisefrance.fr/en/actualite?id=790070.

283 Ibid.

284 EUROCLIMA, "Water sowing and harvesting & ecosystem services".

285 United Nations Environment Programme, *Global Climate Litigation Report: 2023 Status Review* (Nairobi, 2023), foreword and p. 12, available at https://www.unep.org/resources/report/global-climate-litigation-report-2023-status-review.

286 Lisa Mardikian and Sofia Galani, "Protecting the Arctic Indigenous Peoples' livelihoods in the face of climate change: the potential of regional human rights law and the law of the sea", *Human Rights Law Review*, vol. 23, No. 3 (September 2023), pp. 1-24, available at https://doi.org/10.1093/hrlr/ngad020.

287 According to Mardikian and Galani, only 122 of the more than 1,200 cases relating to climate change filed between 2015 and April 2023 were based on human rights.

Masig Island, Torres Strait Islands during a storm surge causing erosion from climate change. Credit: 350 Australia

A number of legal cases have been brought before the European Court of Human Rights that relate to the rights of Indigenous Peoples in the Arctic region, with the violation of the (collective) Indigenous right to property often constituting the entry point. The United States and Canada have not recognized the contentious jurisdiction of the Inter-American Court of Human Rights, but the Inter-American Commission on Human Rights has the authority to investigate alleged violations of the American Declaration of the Rights and Duties of Man in countries that are members of the Organization of American States. The Commission can produce a merits report on a case and can even adopt precautionary measures to prevent serious and irreparable harm or provisional measures in cases of extreme gravity and urgency.

An advisory opinion issued by ITLOS may further clarify the obligations of States Parties to the United Nations Convention on the Law of the Sea to protect the marine environment against the impacts of climate change, thus helping Arctic Indigenous Peoples safeguard their livelihoods.[288]

3.4.4 Indigenous oral literature and biodiversity conservation: the role of poems, proverbs, superstitions and storytelling in Somalia

Drawing from research undertaken by African pastoralists and led by the UNESCO Local and Indigenous Knowledge Systems (LINKS) programme from 2014 onwards, UNESCO published seven case studies that documented traditional knowledge relating to biodiversity conservation, climate change adaptation/mitigation, and disaster risk reduction.[289] One of those studies, carried out by the Somaliland Youth Development and Voluntary Organization, involved documenting Indigenous Somali

288 Ibid.

289 United Nations Educational, Scientific and Cultural Organization, "UNESCO publishes East African case studies on living heritage and climate change", article, 7 December 2021, available at https://www.unesco.org/en/articles/unesco-publishes-east-african-case-studies-living-heritage-and-climate-change; "Supporting research and documentation for case studies of Indigenous and traditional knowledge systems for biodiversity conservation, climate change adaptation/mitigation, and disaster risk reduction in Eastern Africa"; project carried out in 2021 within the framework of the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage and managed by the UNESCO Regional Office for Eastern Africa.

oral literature connected to biodiversity conservation and disaster risk reduction and analysing changes in the transfer or content of Indigenous knowledge that could interfere with effective environmental conservation. Male and female pastoralists representing three generations (grandparents, parents, and the present generation) were interviewed for the study.

The poems, proverbs, superstitions, and storytelling of pastoralists have long played a role in regulating their relationship with the natural environment, often serving as a source for informal traditional laws (*xeer dhaqameed*). These institutionalized customs and norms have served to minimize conflict between humans, animals, and nature, reinforcing the concept that people must live in harmony with each other and the environment or suffer the consequences that come from harming biodiversity and social cohesion. Some examples of the relevant oral literature and traditions captured in the Somali study are as follows:

- With their deep understanding of the high social and ecological value of trees – providing shade, bearing fruit, providing medicinal ingredients, and serving as places to gather, hold community meetings, receive visitors, or request a girl's hand in marriage – the pastoralist communities have traditionally prohibited *gurmo go'an*, or cutting down a tree from a point where it will not regenerate itself. This act is perceived to be so heinous that the term *gurmo go'an* is considered a curse.
- The pastoralists believe there is an intrinsic connection between humans and the environment. Norms and values regulating this relationship are often expressed in poems or sayings that, for example, compare attractive people and animals with the beauty of nature during the rainy season or link respect for venerated trees such as the *Acacia bussei (galool)* and *Ziziphus mauritiana (gob)* with respect for human qualities or behaviour – as exemplified by *dhirtaba geed malka ah baa jir iyo lama garaacaane* (some trees deserve veneration, and cutting them is prohibited) and *dadkuna bir ma geyduu leeyahay iyo lama guhaadshaane* (some people deserve respect and not to be insulted). Ancient wisdom thus reflects the imperative of valuing both humans and the environment.
- It is agreed that animals have intelligence and can develop relationships with humans. Customary laws regulating human-animal relationships are communicated to Indigenous children through storytelling (*sheeko xariiro*) and the sharing of superstitions (*sheeko baraley*).
- Proverbs can provide strong guidance for human behaviour. A recurring theme is not to kill animals that do not harm or attack humans, even if they can (as would be the case with lions or snakes). The proverb *Wii sakaaro iyo way sokeeye midini ma hadho* (loosely translated as "The unjust treatment of humans and the unjustifiable killing of dik-diks will continue haunting those who committed these acts") essentially calls for the fair treatment of others and forbids game hunting and the killing of animals for recreation.
- Stories and beliefs about the supposed (evil-eye or other supernatural) power of animals such as the tortoise, deer, certain lizards, and birds influence the behaviour of local residents from the time they are very young. Superstitions can also influence personal hygiene; for example, children have been taught by the older generations that if they do not dig a hole and bury their hair and nail trimmings, they will be obliged to carry all those loose bits with them after they die. Some bird and gazelle species have traditionally been used for disaster preparedness (and impact reduction), as their behaviour is believed to predict future conflicts and rains.

The case study concludes with an assessment of the challenges affecting the intangible cultural heritage of Somali pastoral communities, including the declining transfer or non-transmission of this heritage to future generations.

3.4.5 New and continuing challenges linked to shifting cultivation and the food security and livelihoods of Indigenous Peoples in Asia

Indigenous Peoples in Asia and many other parts of the world practice the ancestral agricultural method of shifting cultivation (rotational farming) for their livelihoods and food security. Even though it has been practiced for centuries, leaving a small carbon footprint

and conferring many benefits, shifting cultivation in general has been erroneously identified as a major driver of deforestation. However, after deeper research into the facts and benefits surrounding the traditional shifting cultivation of Indigenous Peoples versus large-scale agricultural land conversions (for commercial enterprises such as palm oil plantations), perceptions are beginning to change. Research studies carried out in many parts of the world have challenged the argument that shifting cultivation is a major driver of deforestation relative to other types of land utilization, including logging, mining, large-scale agriculture, and the conversion of forests and grasslands into pasture for grazing (land-use change). Shifting cultivation, unlike the monoculture of cash crops, contributes to biodiversity and ecosystem resistance. It provides food security and supports the livelihoods of Indigenous Peoples and others – and it is also a mechanism for using and conserving traditional knowledge. Laws and policies that restrict shifting cultivation can lead to human rights violations (including forced evictions in some cases), food insecurity, and the weakening or loss of traditional livelihood systems. While it is true that carbon dioxide and other greenhouse gases are emitted during the clearing of vegetation for shifting cultivation, studies have suggested that the carbon sequestration occurring in connection with the reversion to natural wooded vegetation during fallow periods far exceeds these emissions. Most shifting cultivation systems used by Indigenous communities are rotational, and extended fallow periods allow the natural restoration of forest vegetation in the harvested fields.[290]

Under an initiative supported by the Food and Agriculture Organization of the United Nations, the Asia Indigenous Peoples Pact, and the International Working Group on Indigenous Affairs, case studies were undertaken on shifting cultivation in seven countries in Asia. Specifically, the researchers analysed new and ongoing challenges linked to shifting cultivation practices in Bangladesh, Cambodia, India, Indonesia, Lao People's Democratic Republic, Nepal and Thailand.[291] Some important findings highlighted in the final study report include the following:[292]

- Shifting cultivation continues to be an important livelihood system for most of the Indigenous Peoples studied. Where Indigenous Peoples have sufficient and legally recognized access to their lands, natural resources and customary governing institutions, this system allows for sustainable land and resource management, effectively contributing to household food security.
- The Indigenous Peoples studied have had to adapt their livelihood systems in response to internal and external shifts over the past several decades, including altered land-use patterns linked to population increases; changes in government policies, laws and regulations; the intensification of cash crop cultivation and increased integration in the market economy; and shifts in social and cultural values, especially among the younger generations. While some of these changes have created new challenges, others have provided potential opportunities and advantages, including better access to food from the mainstream market and the chance to earn cash income from cash crops, surplus products, or niche products such as organic goods.
- Some of the case studies revealed livelihood transitions that have been particularly challenging. Land scarcity linked to population growth, the failure to diversify income sources, and increasing off-farm employment have been linked to declines in shifting cultivation and negative impacts on livelihoods, but perhaps the most dramatic transitions have been associated with evictions from ancestral lands designated as national parks or reserves. The involuntary resettlement of some Indigenous Peoples has had serious social and cultural repercussions and has been linked to the loss of food security and increased reliance on wage labour. Some communities facing serious food insecurity and the lack of viable alternatives have continued cultivating

290 United Nations Framework Convention on Climate Change, "Drivers of deforestation: facts to be considered regarding the impact of shifting cultivation in Asia", submission to the Subsidiary Body for Scientific and Technological Advice on the drivers of deforestation by Asia Indigenous Peoples Pact (AIPP) and International Work Group for Indigenous Affairs (IWGIA) (2012), available at https://unfccc.int/resource/docs/2012/smsn/ngo/235.pdf.

291 Christian Erni, ed., *Shifting Cultivation, Livelihood and Food Security: New and Old Challenges for Indigenous Peoples in Asia* (Bangkok, Food and Agriculture Organization of the United Nations, International Work Group for Indigenous Affairs, and Asia Indigenous Peoples Pact, 2015), available at https://www.fao.org/3/i4580e/i4580e.pdf.

292 Ibid.; the findings and recommendations are taken from the report's executive summary.

land in their old settlement areas in "violation" of government policy.

- The situation of the Tharu in Nepal offers a striking example of the powerlessness of Indigenous Peoples faced with involuntary eviction from their lands: "The 'post-shifting-cultivation livelihood' of the Tharu illustrates the hard price communities have to pay for forced livelihood transition if there is no prior consent and proper compensation unless planned and implemented carefully with utmost consideration to providing sufficient land suitable for farming."
- All the case studies "highlight the need to assist Indigenous shifting cultivators by improving their agriculture-based livelihood systems for better food security", with special priority given to the security of land tenure. There is the potential for Indigenous Peoples to improve their livelihoods through participation in a "dual economy", whereby farming systems and natural resource bases could be strengthened to support both traditional food production for home consumption and the cultivation of cash crops for the market. Risks associated with the latter – such as overreliance on cash crops, price fluctuations, and hazards linked to the use of agrochemicals – should be well understood before a decision is made to diversify.
- Participants in a regional multi-stakeholder consultation workshop organized as part of this research initiative offered a number of recommendations based on the study findings. These recommendations included strengthening policy advocacy at all levels "on land tenure, food security and livelihood based on the principle of equal partnership between States and Indigenous Peoples and adherence to the right to free, prior and informed consent … [in protecting] shifting cultivation, sustainable resource management and cultural integrity"; raising awareness of Indigenous Peoples' rights in addressing the consequences of large-scale commercial activities carried out on their lands; strengthening capacity-building and skill development, especially among Indigenous women and youth; expanding efforts around biodiversity conservation and enhancement and protection against bio-piracy and illegal patenting; undertaking research and producing documentation on shifting cultivation and related studies; and establishing support services, social protection mechanisms and safety nets such as credit services, market support and insurance.

3.5 Conclusions and recommendations

3.5.1 Conclusions

The following conclusions can be drawn from the information provided in this chapter:

1. Indigenous territories are the best maintained ecosystems in the world; strong and secure territorial rights for Indigenous Peoples and their continued control and management of these areas are essential for preventing further environmental deterioration and destruction.
2. Climate change has had an enormous impact on Indigenous Peoples and their territories and livelihoods. Climate events such as excessive flooding or drought and the unpredictability of the weather have seriously disrupted traditional livelihood and cultural practices.
3. The health and stability of the territories and ecosystems on which Indigenous Peoples depend are becoming increasingly endangered, potentially to the point of no return, seriously affecting Indigenous food security and food sovereignty and the sustenance of traditional knowledge systems.
4. Indigenous Peoples worldwide have witnessed increasing pollution and destruction within their territories due to extractive activities and infrastructure and real estate development. It is rare that internationally recognized Indigenous human rights are respected in such circumstances, with little or no attention given to negative impacts on the cultures, livelihood and integrity of Indigenous communities and their right to self-determination.
5. Indigenous Peoples are directly and indirectly affected both by climate change itself and by policies, programmes and projects focused on climate change adaptation and mitigation. Impacts tend to be largely negative when the latter are externally implemented; more positive impacts are seen where Indigenous

Yurt made from reindeer skins in northern Yamal. Credit: Canva

Peoples are involved in shaping and developing policies and initiatives based on their holistic worldview and respect for nature and are able to closely monitor and control the implementation of climate change projects.

6 Greenwashing and social washing mechanisms serve as a smokescreen for destructive environmental practices, many of which are allowed to continue unchecked. False solutions focus on superficial or even artificial climate concerns, distracting from or delaying the implementation of credible solutions aimed at addressing the underlying causes of the destruction, including extractive or polluting activities and the failure to respect Indigenous rights and knowledge systems.

7 Restrictive climate adaptation and mitigation policies and practices contribute to the further marginalization of Indigenous Peoples, who are often subjected to constraints on the use of their lands and resources, the non-traditional governance or dominance (or even militarization) of territories by outsiders, and (in worst-case scenarios) forced eviction, physical displacement and resettlement.

8 Indigenous Peoples often cannot use the dominant legal and political systems of the countries they live in to advocate for themselves because their status and rights with regard to their lands, territories and resources are unrecognized or insufficiently protected. When Indigenous Peoples are compelled to protest or promote their interests outside formal institutional channels, they are labelled “anti-development” or “anti-progress”, and their views and approaches are politicized and even criminalized.

9 Indigenous Peoples around the world have shared their negative experiences through national, regional and international forums and modern means of communication. The sentiments expressed in many articles and case studies show that the human rights of Indigenous Peoples are treated as inferior to those of dominant societies – an assertion supported by the laws and practices of the latter. This is unacceptable in today’s world, where there is strong emphasis on

respect for individual and collective human rights, the equality of all peoples and cultures, and the importance of environmental preservation, climate justice and human-rights-based sustainable development.

10 Being aware of these injustices and standing by and allowing them to continue is equally unacceptable. Governments, donor and development agencies, financing institutions, and others involved in climate change action seem reluctant to make decisive and effective changes and are content to conduct business as usual, delivering the usual ineffective results. The inadequate ambition to genuinely combat climate change is matched by the inadequate ambition to secure human rights for all.

11 While much has been said about the challenges, this chapter has also highlighted how resilient and adaptive Indigenous Peoples are to climate change and to centuries of oppression, suppression, discrimination and marginalization. Silently and patiently, they have survived and preserved their cultures. They have exemplified how to live in harmony with nature and have contributed to climate change efforts, applying their traditional knowledge systems and time-tested experience to contemporary realities and showcasing their customary governance systems (based on dialogue and consensus) as a viable alternative to modern governance approaches that favour the powerful.

12 Indigenous Peoples are becoming more adept at utilizing both formal and informal mechanisms to secure their rights, including grievance and complaint procedures, court cases and other judicial options (including filing complaints with regional human rights bodies), and dialogue and policy cooperation with Governments and national, multilateral and financing institutions. Increased Indigenous engagement has resulted in a stronger contemporary human rights framework for Indigenous Peoples, with the United Nations Declaration on the Rights of Indigenous Peoples representing the minimum applicable standard accepted by Member States and United Nations agencies, funds and programmes and invoked in a growing number of court cases to support Indigenous rights.

3.5.2 Recommendations

Strategic changes and the acceleration of change processes already in progress are desperately needed. Maintaining the status quo is not an option given the urgency of the climate crisis, the seriousness of the human rights violations being perpetrated against Indigenous Peoples, and the (potentially permanent) losses of Indigenous languages, knowledge systems, ecosystems and biodiversity. The world must recognize that time and resources are being wasted on false solutions that benefit only a select few and ultimately contribute to the destruction of the environment. Intergovernmental bureaucratic processes for building consensus on crucial decisions must be accelerated so that these exigencies can be collectively acknowledged and concerted action taken. Individual countries, regional bodies, United Nations and other multilateral entities, Indigenous Peoples' organizations, NGOs, financing institutions, private sector actors and other key stakeholders should proactively pursue climate justice (including recognizing and respecting the rights of Indigenous Peoples) and undertake climate actions that effectively involve Indigenous Peoples in safeguarding the environment and preventing further deterioration. Some recommendations aimed at addressing these priorities are as follows:

1 The United Nations and its programmes, funds and specialized agencies, in close collaboration with legitimate Indigenous Peoples' representatives, should immediately develop and implement grievance and safeguard mechanisms to ensure that the rights of Indigenous Peoples – as articulated in the United Nations Declaration on the Rights of Indigenous Peoples and including observance of the principle of free, prior and informed consent – are integrated and enforced in all climate change policies, programmes and projects. This process should be led and implemented by legitimate Indigenous Peoples' representatives and periodically monitored and evaluated to assess its effectiveness.

2 The United Nations Permanent Forum on Indigenous Issues should recommend the drafting of a manual (potentially with a training component) for Governments, development organizations, environmental NGOs, Indigenous Peoples' organizations, and other relevant actors on how to ensure that Indigenous rights and interests are effectively factored into climate programmes and projects.

3. An independent review of the climate funding and operations of all organizations, funds and programmes involved in climate finance should be conducted without delay to assess whether/how particular funding approaches affect Indigenous Peoples' rights. Financing entities would need to introduce changes based on the findings of this review and after close consultation with Indigenous representatives and experts.
4. Based on the independent review and meaningful input from Indigenous Peoples, the funding approach going forward should be not only to "do no harm" but to actively "do good" by effectively engaging Indigenous Peoples in climate change processes at the national, regional and international levels, including through the development of their own free, prior and informed consent protocols and procedures where applicable.
5. Indigenous Peoples' organizations and donors should facilitate access to grievance mechanisms and legal action and strengthen the capacity for utilizing these mechanisms in cases where climate change policies, programmes, projects and interventions violate or negatively impact the rights and interests of Indigenous Peoples.
6. Indigenous Peoples' organizations and donors should engage in extensive efforts to raise public and policy awareness of climate crimes, the dangers surrounding false solutions, the negative impacts of climate action on Indigenous Peoples, and the importance of climate justice. Sharing local, national, regional and global Indigenous perspectives in this context is critical.
7. Indigenous Peoples should build or strengthen national and international partnerships and alliances around shared objectives relating to climate justice. Funding agencies and mechanisms should provide financial support for these initiatives and actions undertaken to strengthen cooperation and achieve shared goals.

Meet the Indigenous beekeepers supporting forest conservation in the Yucatán.
Credit: UNDP/Roxana Auhagen

Chapter 4 - Indigenous Economies

Chapter 4: Indigenous Economies

4.1 Introduction

Indigenous Peoples have been particularly affected by global warming owing to their dependence on and close relationship with the environment and its resources.[293] Climate change has had a serious impact on the economies of Indigenous communities, affecting the hunting, fishing and agricultural activities they count on for their sustenance and livelihoods. The climate crisis has led to the weakening of the Indigenous economic base, exacerbating economic inequalities between Indigenous Peoples and mainstream society.

The present chapter provides descriptions and case studies of Indigenous economies, highlighting examples of good practice. It outlines policy options for incorporating Indigenous Peoples' economic systems and priorities in climate efforts at the national, regional and global levels. The chapter concludes with recommendations aimed at facilitating the recognition, protection and support of Indigenous economic systems.

4.2. Indigenous Peoples' economic values and systems

In a broad sense, an economy is a complex set of relationships, activities and practices linked to the production, distribution, and consumption of goods and services at scales ranging from local to global. Political and legal systems, geography, demographics, history, culture, social values, technology, and ecological dynamics determine the context and conditions for economic development and the way an economy functions.[294]

Indigenous economies are local and deeply rooted in tradition. They generally centre around small-scale land- or water-based economic activities as well as sustainable resource management.[295] These economic systems are place-based and anchored in the principle of reciprocity, focusing on the interrelationships between Indigenous Peoples and nature and on cultural, spiritual and environmental preservation. Indigenous economies have traditionally been characterized by equality in all interactions, self-sustainability, and the imperative of protecting and conserving resources for future generations.

4.2.1 Traditional regenerative economic systems with human and environmental well-being at the centre – and their value in the development of solutions to the climate crisis

The economic systems of many Indigenous cultures across the globe are restorative and regenerative in nature, promoting the economic advancement of communities while also supporting responsible and sustainable land and resource management and long-term environmental conservation.

Indigenous economies are diverse, but all are guided by time-tested knowledge, technology and practices that have long contributed to environmental well-being. Lands and coastal areas are typically managed based on the Indigenous cosmovision, veneration of the land, and

293 Mirian Masaquiza Jerez, "Challenges and opportunities for Indigenous Peoples' sustainability", Policy Brief, No. 101 (New York, United Nations, Department of Economic and Social Affairs, April 2021), available at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_101.pdf.

294 Jon Altman, "The hybrid economy and anthropological engagements with policy discourse: a brief reflection", *The Australian Journal of Anthropology,* vol. 20, No. 3 (2009), pp. 318-329, available at http://doi.org/cxk77v.

295 Rauna Kuokkanen, "Indigenous economies, theories of subsistence, and women: exploring the social economy model for Indigenous governance", *The American Indian Quarterly*, vol. 35, No. 2 (spring 2011), pp. 215-240, available at https://dx.doi.org/10.5250/amerindiquar.35.2.0215.

reciprocal responsibility.[296] Several decades ago, Eugene Hunn posited that Indigenous or traditional ecological knowledge "is a consequence of subsistence-based production" – a process of learning and living from the land that exemplifies the connectedness between traditional knowledge and Indigenous economies.[297] It is this concentration on subsistence and environmental awareness that distinguishes Indigenous economies from other economic models; Indigenous Peoples produce and use only what they need and understand how their activities affect the ecosystem.[298]

Indigenous Peoples depend upon their lands, territories and natural resources (including marine resources) for their material and cultural survival. Indigenous communities in the Arctic region have sustained themselves for centuries by gathering, fishing, hunting large land and sea mammals,[299] and herding reindeer.[300] The judicious use of limited natural resources has allowed Indigenous residents to survive in harsh Arctic conditions.[301]

In South America, a traditional Andean economic system has been revitalized in Potato Park, a national park in the Cusco Valley of Peru dedicated to cultivating and preserving native potatoes adapted to grow in high altitudes. The Park is built around the Quechua and Aymara concept of *ayllu*, the main objective of which is "the attainment of well-being or *Sumaq Qausay*, defined as a positive [reciprocal] relationship between humans and their social and natural environments". The alternative economic development model established for Potato Park ensures inclusion, helps preserve the cultural identity of the area, and supports the conservation of the Andean traditional landscape and biocultural heritage.[302]

In the East Africa drylands, pastoralism has historically been the most viable and sustainable livelihood option, with the ability to generate significant returns. As an economic activity, pastoralism is a livestock production system that is set up to withstand the characteristic instability of rangeland environments, where key resources such as nutrients and water for livestock become available in short-lived and largely unpredictable concentrations. Pastoralism is an economic system, but it is also a key component of the Indigenous cultural identity, playing a critical role in sociocultural contexts and practices. Pastoralism contributes significantly to the economies of East Africa. In Kenya, the pastoral sector has an economic worth of $1.13 billion, with the livestock and non-livestock sectors respectively accounting for 92 and 8 per cent.[303] Even under drought or famine conditions, Indigenous pastoralists engage in livestock husbandry that protects biodiversity, and they possess vital knowledge for the protection of nature. Sustainable dryland management is informed by traditional governance and characterized by mobile pastoral custodianship that helps build resilience to climatic changes.

In northern Thailand, the Karen people in the Hin Lad Nai community use a seven- to ten-year rotational farming system to maintain a sustainable environment for humans, animals and plants and help build climate resilience. Their philosophy of sustainable management is reflected in the local expression *Auf hti k'tau hti, auf kauj k' tauz kauj, auf deif k' tauz lei, auf nyaf k' tauz kwiv* (Use water, take care of the river; use land, take care of the forest; use/eat frogs, take care of the cliff; use/eat fish, take care of water sources). This long-term rotational system contributes to an overall reduction in carbon emissions, helping to combat climate change.

296 Stephen T. Garnett and others, "A spatial overview of the global importance of Indigenous lands for conservation", *Nature Sustainability*, vol. 1, No. 7 (July 2018), pp. 369-374, available at https://doi:10.1038/s41893-018-0100-6.

297 Eugene S. Hunn, "The value of subsistence for the future of the world", in *Ethnoecology: Situated Knowledge, Located Lives*, Virginia D. Nazarea, ed. (University of Arizona Press, 1999), pp. 23-36, available at https://faculty.washington.edu/stevehar/anth458_hunn_value_of_subsistence.pdf.

298 Bhaskar Nath, ed., *Environmental Education and Awareness: Encyclopedia of Life Support Systems*, vol. 2, UNESCO-Encyclopedia of Life Support Systems series (Oxford, EOLSS Publishers, 2009).

299 Nicole S. Stuckenberger, *Thin Ice: Inuit Traditions within a Changing Environment*, 1st ed., publication linked to Hood Museum exhibition (Hanover, New Hampshire, University Press of New England, 2007), available at https://hoodmuseum.dartmouth.edu/explore/print-archive/thin-ice-inuit-traditions-within-changing-environment.

300 Igor Krupnik, *Arctic Adaptations: Native Whalers and Reindeer Herders of Northern Eurasia* (Hanover, New Hampshire, and London, University Press of New England, 1989), available at https://collections.dartmouth.edu/ebooks/krupnik-arctic-1993.html#epubcfi(/6/2[nav_00]!/4/1:0).

301 Alexandra Lavrillier and Semen Gabyshev, *An Arctic Indigenous Knowledge System of Landscape, Climate, and Human Interactions: Evenki Reindeer Herders and Hunters*, Studies in Social and Cultural Anthropology (Verlag der Kulturstiftung Sibirien, 2017).

302 Bernard Yun Loong Wong and Alejandro Argumedo, "The thriving biodiversity of Peru's Potato Park", Our World article, 4 July 2011 (United Nations University), available at https://ourworld.unu.edu/en/the-thriving-biodiversity-of-peru-potato-park.

303 Dickson M. Nyariki and Dorothy A. Amwata, "The value of pastoralism in Kenya: application of total economic value approach", *Pastoralism*, vol. 9, art. 9 (2019), available at https://doi.org/10.1186/s13570-019-0144-x.

Indigenous Hmong women
plant rice shoots in Bac Ha, Viet Nam.
Credit: UN Photo

For example, allowing 236 hectares of fields to lie fallow for up to 10 years stores 17,348 tons of carbon, while the burning of vegetation to clear the land and enrich the soil releases just 476 tons of carbon dioxide. Long fallow periods between crop rotations provide time for regeneration and regrowth, so areas can be used not only for farming but also as a source of food for animals and humans. Through this natural process, greenhouse gas emissions are reduced and the balance of nature is maintained, with all plants, animals and humans able to coexist harmoniously to sustain life.[304]

In the Pacific, diverse Māori economies are grounded in conceptions of identity, respect for the environment, and sociohistorical experiences. For Māori Peoples, social and economic relationships start with their *pepeha* (an initial introduction or identity statement highlighting one's connections to people and places) and *whakapapa* (how Māori communicate their knowledge, identity, heritage, and connections to the past, present, and future). It is through their *whakapapa* that many Māori enterprises will prioritize engagement at a cultural level in their economic activities to establish solid foundations for success. Ātihau-Whanganui Incorporation, a 9,000-shareholder farming collective set up to help people and land flourish together, seeks to achieve economic success while guided by the principles of *kaitiakitanga* (responsibility to people and nature), *manaakitanga* (supporting one another), *taonga tuku iho mō ngā uri whakatipu* (guardianship of resources for future generations), and achieving the right balance between profit, people and planet.[305]

4.2.2 Actions of the public and private sectors that pose a threat to Indigenous economies and economic systems

4.2.2.1 The threat of capitalism: key features of "disaster capitalism", its colonialist origins, how it drives the climate crisis, and the role of the State and corporate sectors (including the military industrial complex)

Indigenous lands and territories have been subjected to economic restructuring and capitalist pressures since the start of the various colonial periods, with an often devastating impact on Indigenous economies. One of the legacies of colonialism has been the disenfranchisement of Indigenous Peoples, who have been prevented from engaging in their traditional economies but also largely excluded from participating in the national economy. Too often, mainstream national economic and environmental policies disregard Indigenous subsistence economies, considering them to be backward and in need of modernization. These policies threaten Indigenous economic practices that have always prioritized environmental sustainability and have contributed significantly to national economies.

Colonialism and capitalism are strongly linked, and it is very difficult to decolonize capitalist markets and systems. It is capitalism that has created political and economic space for neoliberal initiatives to disproportionately benefit the wealthy while marginalizing Indigenous Peoples. There is a stark difference between Indigenous economic values focused on sustainability, stewardship, and accountability and Western economic values such as capitalism, wealth creation, competition, and externalization. More than four centuries of capitalism and colonialism have ensnared Indigenous Peoples in the traps of the capitalist world system.[306] Indigenous Peoples have been marginalized by colonialism and subsequent State development efforts, including policies characterized by the increasing

304 Prasert Trakansuphakon, "Sustainability in action: the Karen Peoples' farming system", 360info.org article, 21 December 2022, available at https://360info.org/sustainability-in-action-the-karen-peoples-farming-system/.
305 BERL and OpinioNative, "Mahi tahi tatou, kaha ake tatou: the Maori economy – obstacles and opportunities" (October 2021), available at https://www.westpac.co.nz/assets/About-us/sponsorship/documents/The-Maori-economy-obstacles-and-opportunities-Westpac-NZ-Oct-2021.pdf.
306 John H. Bodley, *Victims of Progress*, 5th ed. (Lanham, Maryland, Altamira Press, 2008).

alienation of land and subsurface rights. Many of the resource-rich areas of the globe are inhabited by Indigenous Peoples, and the movement of corporations into these areas have often led to enduring conflicts.[307] Globally, Indigenous Peoples' lands are regularly expropriated by States and capitalist corporations so that natural resources above and below the ground can be exploited and channelled into ever-widening streams of capital accumulation. As a growing number of Indigenous Peoples lose access to their subsistence resources, they are increasingly forced to abandon their traditional economies and work in the capitalist labour market. Indigenous Peoples are under increasing pressure to conform to the global market economy and capitalistic laws that force them to endure profit-driven development projects such as logging and mining and to organize their economies in ways that impact their sovereignty, economic autonomy, and self-determination. Indigenous economic prosperity is not possible unless laws and policies integrate the priorities and perspectives of Indigenous Peoples and recognize their rights.

Indigenous economies have been in existence for millennia, maintaining harmony with nature through traditional knowledge and sustainable practices informed by Indigenous values and principles. Although Indigenous economies contribute significantly to many national economies, they are under threat from the actions of various actors within the public and private sectors.

It is explained in a 2019 report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services that nature directly underpins the livelihoods and economies of Indigenous Peoples and the rural and urban poor, either through direct consumption or through the income generated by trade in material contributions. The report notes that nature and its contributions are relevant to the achievement of Sustainable Development Goals relating to education, gender equality, reducing inequalities, and promoting peace, justice and strong institutions, but that the current focus and wording of the related targets obscures or omits their relationship to nature.[308] The disconnect between nature, livelihoods and peoples in national and global policy makes it difficult for Indigenous economies to secure support and thrive.

Indigenous Peoples face discrimination in established socioeconomic systems, and even well-intentioned efforts (such as those aimed at sustainable development) do not work to their advantage.[309] Contemporary development approaches do not reflect a balance between social, economic, and environmental dimensions (an integrated nature-human-centric perspective) but rather focus on economic growth as the basis for sustainable development. Modern commercial agricultural production generally involves the conversion of lands to monoculture farming dependent on chemicals, leaving little to no space for Indigenous knowledge and traditional agricultural economies in areas once stewarded by local communities.

The criminalization of traditional practices such as rotational farming in Asia and the gathering of non-timber products (plants and fungi) in some parts of Africa, military interventions and the presence of non-State armed actors in Indigenous territories, corporate land-grabbing and polluting activities, and the absence of government support are all major obstacles to the preservation and perpetuation of Indiegenous economies. Indigenous women in South America produce and sell handicrafts, largely on an informal basis, though some have formed associations. The lack of public policies to properly support these women in their entrepreneurial endeavours hampers them from further developing their economic pursuits. There is a growing call for serious government programmes and policies that promote and facilitate local economic

307 Whiteman, "All my relations: understanding perceptions of justice and conflict between companies and Indigenous Peoples", *Organization Studies*, vol. 30, No. 1, pp. 105-124, available at https://doi10.1177/0170840608100518.

308 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, Sandra Diaz and others, eds. (Bonn, IPBES secretariat, 2019), available at https://files.ipbes.net/ipbes-web-prod-public-files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf.

309 William Nikolakis, Harry W. Nelson and David H. Cohen, "Who pays attention to Indigenous Peoples in sustainable development and why? Evidence from socially responsible investment mutual funds in North America", *Organization & Environment,* vol. 27, No. 4 (2014), available at https://doi.org/10.1177/1086026614546812.

activities and the intergenerational transmission of Indigenous knowledge.[310]

The Indigenous World 2018, a report published by the International Work Group for Indigenous Affairs, indicates that one of the biggest global threats to Indigenous Peoples' livelihoods is land-grabbing.[311] The Indigenous population in Nepal, numbering around 10 million, is experiencing this firsthand, with their livelihoods being threatened by large-scale investment initiatives and infrastructure projects that are forcing them off their ancestral lands.

There are also increasing reports of the negative impact of green development projects on Indigenous economies, as exemplified in the following account:

> Over the past half century, numerous hydroelectric dam schemes have been constructed in the Brazilian Amazon, flooding hundreds of square kilometres of Indigenous territories used for hunting, fishing and the practice of Indigenous traditions closely connected to the river and rainforest. […] The largest and perhaps most infamous, the Belo Monte Dam, started in 2019. The dam and its reservoirs displaced around 20,000 Indigenous People from their ancestral lands, including the Kayapó, Juruna, Arara and Xikrin Peoples. […] In the so-called 'Lithium Triangle' of the Andean border regions of Argentina, Bolivia and Chile, lithium miners are encroaching on Indigenous territories where salt is traditionally cultivated and harvested to 'mine' water by evaporating lithium-rich brines.[312]

The Ngorongoro Conservation Area in Tanzania was originally set up for multiple land use, accommodating wildlife, tourists, and the Indigenous Maasai Peoples. Initially, small-scale subsistence farming, livestock grazing in critical areas such as the craters, and other Indigenous social and economic activities were permitted. However, these activities have now been restricted, negatively impacting the pastoralist economy of the Maasai.[313]

The impacts of carbon credit schemes are explored in the preceding chapter but deserve mention here as well, given the threat they pose to Indigenous economies and livelihoods. A meeting input prepared by the Indigenous Environmental Network in 2023 highlights the following:

> Carbon traders gain the power to target and commodify Indigenous Peoples' territories. Putting a price on carbon sequestered in forests, soils, water, and biodiversity is part of the predatory instinct of the Black Snake devastating the sacredness of Mother Earth and Father Sky. It disguises itself as respectful of Indigenous rights and traditional Indigenous knowledge, but it is an insidious form of capitalism that commodifies nature on Mother Earth and corrupts the Sacred. … With billions at stake for new carbon market development and so called "nature-based solutions (NBS)", carbon traders are targeting Indigenous Peoples' territories across the world. After 25 years of debate on carbon trading, offset profiteers have pocketed billions through programs like Reducing Emissions from Deforestation and forest Degradation (REDD+). These programs have eroded Indigenous Peoples' sovereignty and done nothing to reduce carbon in the atmosphere.[314]

310 International Work Group for Indigenous Affairs and International Labour Organization, *Indigenous Peoples in a Changing World of Work: Exploring Indigenous Peoples' Economic and Social Rights through the Indigenous Navigator* (2021), available at https://www.ilo.org/publications/indigenous-peoples-changing-world-work-exploring-indigenous-peoples.

311 Pamela Jacquelin-Andersen, ed., *The Indigenous World 2018* (Copenhagen, International Work Group for Indigenous Affairs, 2018), available at https://www.iwgia.org/images/documents/indigenous-world/indigenous-world-2018.pdf.

312 Minority Rights Group International, *Minority and Indigenous Trends 2019: Focus on Climate Justice* (London, 2019), pp. 28-29, available at https://minorityrights.org/resources/minority-and-indigenous-trends-2019-focus-on-climate-justice/.

313 Gideon Sanago (for Debates Indígenas), "How Indigenous Peoples in Africa are impacted by climate change", International World Group for Indigenous Affairs news, available at https://www.iwgia.org/en/news/4959-how-indigenous-peoples-in-africa-are-impacted-by-climate-change.html.

314 Alberto Saldamando, "Green financing: a just transition to protect Indigenous People's rights", prepared on behalf of the Indigenous Environmental Network (21 April 2023) in response to a call for inputs from the Special Rapporteur on the rights of Indigenous Peoples for discussion at the fifty-fourth session of the United Nations Human Rights Council; see also Rainforest Action Network and others, *Banking on Climate Chaos: Fossil Fuel Finance Report 2024*, available at https://www.bankingonclimatechaos.org/wp-content/uploads/2024/07/BOCC_2024_vF3.pdf.

Indigenous women in jingle dresses. Credit: Gemma Kentish

4.2.2.2 Trade provisions enabling the violation of Indigenous rights and barriers to the participation of Indigenous representatives in trade negotiations

Indigenous Peoples are often politically disenfranchised and are not represented in international trade negotiations, resulting in economic arrangements that negatively affect the development of their economies. Some treaties require the gradual liberalization of all economic sectors, including those involving the exploitation or extraction of natural resources. Many of these resources are found in Indigenous Peoples' territories and are the only assets they have to bargain with in negotiations – but only if they can secure a place at the negotiating table.[315]

The lack of international personhood for Indigenous Peoples impacts their ability to participate in international trade and has important implications for the growth and diversification of their economies. States are solely responsible for trade negotiations, agreements and regulations; the North American Free Trade Agreement, for example, was the product of government negotiations, with Indigenous Peoples having no input in the decision-making.[316]

In the Arctic region, Inuit and other Indigenous communities have been deeply affected by the European Union seal regime, including Regulation No. 1007/2009

315 The experience under the United States-Peru Trade Promotion Agreement (particularly the annex on tropical hardwoods) is illustrative; see Matt Finer and others, "Logging concessions enable illegal logging crisis in the Peruvian Amazon", *Scientific Reports,* vol. 4, art. 4719 (2014), available at https://www.nature.com/articles/srep04719/fig_tab.

316 Brenda L. Gunn, "Impacts of the North American Free Trade Agreement on Indigenous Peoples and their interests", *Balayi: Culture, Law and Colonialism*, vol. 9, No. 5 (2006), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586163.

on trade in seal products and Regulation 2015/1775 amending the 2009 Regulation and repealing Regulation 737/2010. A set of World Trade Organization rulings in 2014 upheld the ban on trade in seal products and led to the removal of an exception relating to hunts conducted for the sustainable management of marine resources; however, the 2015 amended Regulation "acknowledges that this may create problems in some Member States and remarks that this should be taken into account in future assessments".[317] In the 2015 Regulation, two exceptions to the ban are granted for seal products that come from hunts conducted sustainably by Indigenous communities and for occasional imports of seal products for the personal use of travellers or their families; these exceptions are contingent upon the hunts being traditionally conducted by Indigenous communities for their subsistence, with due regard for animal welfare. Trade policies such as these clearly reflect the lack of consultation with the Indigenous Peoples affected. Free, prior and informed consent is critical to self-determination in trade decisions and practices (and in all other matters affecting Indigenous Peoples), but this principle is not observed when Indigenous Peoples' rights are not secure and their authority not fully recognized.

4.3 The importance of equitable wealth distribution: how global wealth concentrated in the hands of the few is a barrier to the realization of Indigenous Peoples' human rights and their capacity to contribute fully to local and global climate crisis efforts

There have been calls for increased efforts aimed at empowering Indigenous Peoples to function as effective economic agents able to participate in the fast-expanding global economic sphere through culturally distinctive forms of wealth creation.[318] The subsections below highlight good practices, demonstrating how State and private sector actors can engage with Indigenous Peoples in culturally appropriate ways to protect and promote their local economies and economic systems.

4.3.1 Examples of public- and private-sector partnerships with Indigenous Peoples that are strengthening Indigenous economies

Sealord Group Limited is a 50-50 joint venture between Moana New Zealand (a Māori-owned enterprise) and the Japanese seafood company Nippon Suisan Kaisha, Ltd. (Nissui). Sealord is engaged in sustainable fishing

317 Council of the European Union, "Seal products trade: the EU ban adapted to WTO rules", press release, 1 October 2015, available at https://www.consilium.europa.eu/en/press/press-releases/2015/10/01/seal-products/.

318 Léo Paul Dana, "Entrepreneurship in a remote subarctic community", *Entrepreneurship Theory and Practice*, vol. 20, No. 1 (October 1995), pp. 57-73, available at https://doi:10.1177/104225879502000104; Kevin Hindle and Michele Lansdowne, "Brave spirits on new paths: toward a globally relevant paradigm of Indigenous entrepreneurship research", *Journal of Small Business & Entrepreneurship*, vol. 18, No. 2 (January 2005), pp. 131-142, available at https://doi:10.1080/08276331.2005.10593335; Ana Maria Peredo and others, "Toward a theory of Indigenous entrepreneurship", *International Journal of Entrepreneurship and Small Business*, vol. 1, No. 1/2 (October 2004), available at https://www.researchgate.net/publication/228226622; Jane Swinney and Rodney Runyan, "Native American entrepreneurs and strategic choice", *Journal of Developmental Entrepreneurship*, vol. 12, No. 3 (2007), pp. 257-273, available at https://doi:10.1142/S1084946707000678.

and aquaculture and works to protect Māori rights and interests. The company employs more than 1,200 people in New Zealand and beyond, and the partnership has led to the company trading its products all over the globe, with a seafood portfolio worth more than $500 million.[319]

In 2022, the Advisory Committee of Indigenous Women of Panama (CAMIP) launched the Economic Empowerment Plan for Indigenous Women of Panama (PEMIP 2025), a "comprehensive and pioneering initiative that seeks the full inclusion and effective exercise of the socioeconomic rights of Panamanian Indigenous women, based on their protagonism and self-determination". The initiative creates a space where actors from the public and private sectors can supply resources and a commitment to support the Indigenous women of Panama. The Forest Stewardship Council Indigenous Foundation is supporting the implementation of PEMIP 2025 through three of its components, including ancestral cultural restoration, leadership, and governance. The Ministry of Education, Ministry of Social Development, and Ministry of Labor and Workforce Development in Panama are committed and empowered to support the Plan, with ENRED Panamá providing technical assistance.[320]

These cases exemplify how the private sector and State agencies can partner with Indigenous Peoples to achieve mutual economic growth and prosperity.

4.3.2 Reframing climate debt and climate finance: recognizing the incalculable "debt" that is owed – particularly by the wealthiest economies with the largest environmental destruction footprints – to the Earth and to Indigenous Peoples for their invaluable contribution to nature conservation and sustainability

Climate activists have asserted that Indigenous Peoples' organizations and some developing countries are owed a climate debt by developed countries due to the historical contribution of the developed world to human-induced climate change and the climate crisis. The argument is that developed countries have been largely responsible for creating more greenhouse gas emissions than the Earth has been able to absorb and thus bear most of the responsibility for climate change and its impacts. Countries with a relatively large carbon footprint are leaving very little space for others; in practical terms, the need to reduce emissions globally is constraining the ability of poorer countries to pursue development activities.[321]

The World Bank *World Development Report 2010* affirms that developed countries have emitted the larger proportion of cumulative emissions since the Industrial Revolution and that their per capita emissions are much higher than those of developing countries, despite the fact that the aggregate annual emissions of developing countries now exceed those of developed countries, largely owing to the rapid growth of populous countries such as China and India.[322]

A 2010 Climate Justice Brief on climate debt[323] asserts that developed countries and corporations from the global North, driven by a fossil-fuelled way

319 Te Ohu Kaimoana, "Sealord" (Wellington, New Zealand), available at https://teohu.maori.nz/who-we-work-with/sealord/.
320 FSC Indigenous Foundation, "Breaking gaps, achieving dreams", available at https://www.fscindigenousfoundation.org/breaking-gaps-achieving-dreams/.
321 Jonathan Pickering and Christian Barry, "On the concept of climate debt: its moral and political value", *Critical Review of International Social and Political Philosophy*, vol. 15, No. 5 (2012), pp. 667-685, available at https://doi.org/10.1080/13698230.2012.727311.
322 World Bank, "World Development Report 2021: Development and Climate Change" (Washington, D.C., 2010), available at https://documents1.worldbank.org/curated/en/201001468159913657/pdf/530770WDR02010101Official0Use0Only1.pdf.
323 Third World Network, "Climate debt", Climate Justice Briefs, No. 1 (November 2010), available at https://www.twn.my/title2/climate/pdf/climate_justice_briefs/01.Climate.debt.pdf.

of life, have caused climate change and that the main victims of climate change are developing countries and communities. It is contended that developed countries and corporations have accrued climate debt for their excessive emissions and use of atmospheric space and the adverse impacts of climate change on the poor – and that the only fair and equitable solution is to honour this debt and solve the climate crisis. It is argued that repayment of the debt should include not only financial compensation but also restorative justice for those adversely affected by climate-related impacts.[324] For Indigenous Peoples, who are on the front lines of climate change and have been advocating for debt repayment and restorative justice to compensate for losses and damages suffered as a result of the climate crisis, a key priority is making financial instruments directly available and accessible to Indigenous communities to enable them to respond to climate change.

The subject of climate debt was not addressed during the original United Nations Framework Convention on Climate Change negotiations in the mid-1990s, but the idea has since garnered growing support – particularly after the lead-up to the fifteenth session of the Conference of the Parties (COP 15) in Copenhagen in 2009, where the Plurinational State of Bolivia raised the issue in its formal submission. While calls for climate debt repayment have been highly visible in media reports of recent climate change negotiations, climate debt and any obligations attaching thereto have been omitted from the resulting agreements, with other principles for allocating responsibility (such as "comparable effort" or "equity") gaining far more traction.[325]

4.3.3 Financing Indigenous Peoples' climate efforts and priorities: the need for countries to cease investing in life-destroying activities and instead invest in life-nurturing initiatives

Addressing climate change, conserving the environment, securing land rights, and building more resilient livelihoods all require action by Indigenous Peoples and their organizations. Individuals play an important role in advocacy, but representative bodies reflect a strong collective commitment and can be particularly effective as agents of change. Unfortunately, many Indigenous Peoples' organizations are struggling to grow and strengthen their impact because of funding challenges.[326]

At the 2021 United Nations Climate Change Conference (COP 26) in Glasgow, five Governments and 17 private donors pledged a total of $1.7 billion in direct funding to support Indigenous Peoples' land rights and forest tenure. In addition, several public funding agencies expressed their commitment to direct more climate and biodiversity funding to Indigenous Peoples' organizations. However, in a review carried out a year after the Conference, donors reported that only about 7 per cent of that funding was going directly to Indigenous Peoples' organizations.[327] In a groundbreaking paper entitled "Principles and guidelines for direct access funding for Indigenous Peoples' climate action, biodiversity conservation and fighting desertification for a sustainable planet", the International Indigenous Peoples' Forum on Climate Change (IIPFCC) emphasizes that, aside from calls for the recognition of Indigenous Peoples' rights, Indigenous Peoples demand that "adequate and accessible financing be made available to support their self-determined climate actions on the ground to combat climate change, desertification, and biodiversity loss". The paper acknowledges that "there have been some efforts to establish funding mechanisms that address this demand by Indigenous Peoples by different

324 Ibid.
325 Pickering and Barry, "On the concept of climate debt: its moral and political value".
326 Roshan Paul and others, "Greening the grassroots: rethinking African conservation funding" (Masiasili and Synchronicity Earth, July 2022), available at https://www.maliasili.org/greeningthegrassroots.
327 John Cannon, "Small share of land rights pledge went to Indigenous groups: progress report", Mongabay article, 7 November 2022, available at https://news.mongabay.com/2022/11/small-share-of-land-rights-pledge-went-to-indigenous-groups-progress-report/

institutions. However, it has been noted by a study commissioned by Rainforest Foundation Norway that less than 1 per cent of funding actually reaches Indigenous Peoples to secure tenure rights and manage forests in tropical countries. Governments must also recognise the false dichotomy of developed and developing countries in regard to funding initiatives and actions directed to Indigenous Peoples." The paper defines direct access as direct negotiations and discussions between Indigenous Peoples and financial partner countries or funding sources "to determine [the] level of funding, parameters, and agreements on the funding mechanisms".[328]

4.4 Approaches and mechanisms for supporting Indigenous Peoples' climate efforts, economic development, and other priorities

4.4.1 Direct access to grants for Indigenous Peoples

Grants should be provided directly to Indigenous Peoples to help them address their needs and priorities and to support their economies and ways of life. Establishing Indigenous-led funds and other intermediary arrangements or partnerships can help facilitate grant disbursement and streamline the distribution process.

4.4.2 Capacity development

Targeted investment is needed to strengthen the capacity of Indigenous Peoples' organizations and support their work.[329] Providing training and education to harness Indigenous knowledge and encourage innovation, particularly among Indigenous youth, can bolster local economies. The Hin Lad Nai villagers in Thailand have developed a community farming enterprise, and to strengthen their business they have carried out a series of capacity-building trainings to identify opportunities to develop and manage the production of non-timber forest products (such as honey and tea), improve the branding of their products, and increase their market value. The earnings from this enterprise will allow them to support the local communities as well as their Indigenous organizations.

4.4.3 Rights-based policies on lands and resources: the importance of Indigenous involvement

Countries endeavouring to support the climate efforts and priorities of Indigenous Peoples need to reinforce their resilience through the activation of rights-based policies that support secure land tenure, access to social services and other basic necessities, engagement in decision-making processes, and self-determination.[330] Steps should be taken to ensure the participation of Indigenous Peoples in climate policy governance at all levels. Article 32(2) of the United Nations Declaration on the Rights of Indigenous Peoples requires that free, prior and informed consent be obtained from Indigenous Peoples in matters that may affect their fundamental rights with regard to "their lands or territories or other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources", and article 43 affirms that these rights "constitute the minimum standards for the survival, dignity, and well-being" of the world's Indigenous communities. Consultations held to secure free, prior and informed consent must respect local governance and decision-making processes and structures, must be conducted in Indigenous languages and according to the time frames set by the Indigenous communities involved, and must be free of coercion or threat. Indigenous Peoples must be fully involved in the formulation, implementation and evaluation of all aspects

328 International Indigenous Peoples Forum on Climate Change, "Principles and guidelines for direct access funding for Indigenous Peoples' climate action, biodiversity conservation and fighting desertification for a sustainable planet" (2022), pp. 2-3, available at https://assets.takeshape.io/86ce9525-f5f2-4e97-81ba-54e8ce933da7/dev/01375808-c4d4-412c-80a5-8a516e835976/Indigenous%20peoples%20-%20principles%20%26%20guidelines%20for%20direct%20access%20funding.pdf.

329 Fred Nelson and others, "Better climate funding means centering local and Indigenous communities", *Stanford Social Innovation Review* (11 May 2023), available at https://doi.org/10.48558/P3HW-E840.

330 Peter Grant, ed., *Minority and Indigenous Trends 2019: Focus on Climate Custice* (London, Minority Rights Group International, 2019), available at https://minorityrights.org/resources/minority-and-indigenous-trends-2019-focus-on-climate-justice/.

A member of the Kasepuhan Cibedug Indigenous Peoples in Indonesia, holding a bamboo hat. Her community uses traditional practices to manage and preserve the forests in their ancestral lands. Credit: UNDP Indonesia / Roy Prasetyo

of development plans and programmes that may affect them so that they are able to protect their collective rights over the lands, territories and natural resources on which their economies depend. At present, the principle of free, prior and informed consent is not being fully observed by government or private actors.

4.4.4 Initiatives supporting the development of Indigenous economies

Many governments provide support for Indigenous communities to help them navigate the evolving economic landscape – in particular the back-and-forth movement between subsistence and market-driven activities. Public authorities provide targeted subsidies, pass laws protecting the land rights of Indigenous Peoples or giving them preferential treatment, develop market infrastructure, and furnish other types of support. Sometimes, public authorities redistribute the resources they receive to help the most vulnerable communities. With Government and other outside support, there is always the danger of Indigenous Peoples becoming overly dependent on external influences or subject to external pressures from those in positions of power, including State or corporate entities.[331] It is important that Indigenous Peoples determine their own needs and priorities and that any support they receive reflects respect for their cultures, values, and community relationships.

Policies should be adopted that promote and support the sustained viability of Indigenous economies. In implementing these policies, efforts should be aimed at restoring, protecting and improving Indigenous lifeways and livelihoods and supporting traditional activities, including those led by Indigenous women, youth, and persons with disabilities.

331 Lee Huskey, "Challenges to economic development: dimensions of 'remoteness' in the North", *Polar Geography,* vol. 29, No. 2 (April 2005), pp. 119-125, available at https://doi:10.1080/789610129.

4.4.5 Support for Indigenous cooperatives and associations

Cooperatives can be instrumental in fulfilling the aspirations of Indigenous Peoples to exercise control over their own institutions, ways of life, and economic development.[332] These community-led enterprises can provide a sustainable income and livelihood and often prioritize environmental conservation based on Indigenous knowledge.[333]

4.4.6 Strengthened partnerships

The International Partnership for the Satoyama Initiative, a global collaborative enterprise, recognizes the importance of engaging stakeholders at the local level in building a green economy. Collaborative relationships between diverse organizations and communities and Indigenous Peoples allow the sharing of knowledge and skills, building a broader understanding of all the socioecological and production aspects of creating and growing green enterprises. Efforts such as these contribute significantly to the development of green economies and sustainable societies.[334]

4.4.7 Improved measurement and monitoring of Indigenous economic development to enhance data availability

Substantial data gaps exist, making it difficult for policymakers and Indigenous Peoples to respond to challenges with informed decisions and targeted solutions. To help bridge this gap, Indigenous Peoples have engaged in development schemes such as the Indigenous Navigator, a collaborative initiative carried out with the support of the European Union by a Steering Committee of five partners – the Asia Indigenous Peoples Pact, Danish Institute for Human Rights, Forest Peoples Programme, Tebtebba Foundation, and International Work Group for Indigenous Affairs. The Indigenous Navigator is described on its website as "a framework and set of tools for and by Indigenous Peoples to systematically monitor the level of recognition and implementation of their rights. By using the Indigenous Navigator, Indigenous organizations and communities, duty bearers, NGOs and journalists can access free tools and resources based on community-generated data." The Indigenous Navigator "monitors the implementation of the United Nations Declaration on the Rights of Indigenous Peoples, core human rights conventions as they pertain to Indigenous Peoples, essential aspects of the Sustainable Development Goals, [and] the outcomes of the World Conference on Indigenous Peoples".[335]

Improved data collection – carried out collaboratively by Indigenous Peoples and various strategic partners – can ultimately lead to better policy decisions and socioeconomic sustainability. Actions undertaken in this area support various targets and indicators used to identify priorities and measure progress in the implementation of the Sustainable Development Goals. Two indicators relate directly to Indigenous Peoples; indicator 2.3.2 measures the "average income of small-scale food producers, by sex and Indigenous status", and indicator 4.5.1 reflects parity indices (including those related to Indigenous Peoples) linked to ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all (Goal 4). A number of other indicators, including 1.4.2 and 5.a.1 on land rights, are also relevant to Indigenous Peoples.[336] The Global Set of Climate Change Statistics and Indicators,[337] adopted at the fifty-third session of the United Nations Statistical Commission in March 2022, includes indicator 104 on the number of

332 International Labour Organization, "Securing rights, creating jobs and ensuring sustainability: a cooperative way for empowering indigenous peoples", Cooperatives and the World of Work Series, No. 5 (Geneva, International Labour Office, 2016), available at https://www.ilo.org/publications/cooperative-way-empowering-indigenous-peoples.

333 Martin Oelz, Rishabh Kumar Dhir and Marek Harsdorff, "Indigenous peoples and climate change: from victims to change agents through decent work" (Geneva, International Labour Office, 2017), available at https://www.ilo.org/publications/indigenous-peoples-and-climate-change-victims-change-agents-through-decent.

334 Satoyama Initiative, "The International Partnership for the Satoyama Initiative (IPSI)", available at https://satoyama-initiative.org.

335 Indigenous Navigator, "What is the Indigenous Navigator?", available at https://indigenousnavigator.org/what-is-the-indigenous-navigator.

336 United Nations, Department of Economic and Social Affairs, "Indigenous Peoples menu", Social Inclusion page, available at https://www.un.org/development/desa/indigenouspeoples/focus-areas/post-2015-agenda/the-sustainable-development-goals-sdgs-and-indigenous.html.

337 United Nations, Statistics Division, "Environmental statistics: Global Set of Climate Change Statistics and Indicators, available at https://unstats.un.org/unsd/envstats/climatechange.cshtml.

Indigenous persons living in isolated areas. In resolution A/RES/69/2 on the World Conference on Indigenous Peoples, adopted by the General Assembly on 22 September 2014, States commit themselves "to working with Indigenous Peoples to disaggregate data, as appropriate, or conduct surveys and to utilizing holistic indicators of Indigenous Peoples' well-being to address the situation and needs of Indigenous Peoples and individuals, in particular older persons, women, youth, children and persons with disabilities".[338]

4.5 Conclusions and recommendations

4.5.1 Conclusions

This chapter emphasizes that vibrant Indigenous economies are fundamental to self-determination, allowing Indigenous Peoples to develop based on their own lifeways. Enabling policies are needed to promote the success of Indigenous economies, support secure land tenure, improve access to direct financing, and ensure the participation of Indigenous communities in decision-making.

Indigenous economies today often reflect a mix of subsistence and market approaches. While development trends favour the latter, it is important to acknowledge that subsistence production continues to contribute meaningfully to national and global economies. There is a need for increased support for Indigenous economies and for the knowledge, cultures and traditions that underpin them.

It is critically important that State economic policies, laws and initiatives support the sustainability of Indigenous economies and lifeways, as this will contribute to global sustainability. Policies and policymaking processes need to be more inclusive to ensure that Indigenous Peoples, who have traditionally been underrepresented, are able to participate in and benefit from negotiations and decisions relating to trade, economic development, the environment and other priority areas and sectors.

4.5.2 Recommendations

- States should recognize Indigenous Peoples' rights with regard to their lands, territories, resources, traditional knowledge and cultures – all of which form the basis of their economies.
- In order to strengthen the resilience of Indigenous communities, States and private actors should observe the principle of free, prior and informed consent and ensure the full and effective participation of Indigenous Peoples in the design, planning, execution and evaluation of initiatives that are likely to affect them.
- States should address the actual or potential impact of major development projects on Indigenous Peoples in order to appropriately manage the attendant risks, with particular attention given to extractive industry activities, infrastructure development, and green growth initiatives.
- States should adopt policies, implement initiatives, and provide resources to preserve and strengthen Indigenous economies. However, such support should be informed by the self-determination of Indigenous Peoples and aligned with their values and priorities.
- States should support the development of more inclusive economies, adopting relevant policies and facilitating the formation of private and public partnerships with Indigenous communities based on respect and trust.
- States should ensure that human rights are recognized and enforced in corporate law, trade agreements, the credit and insurance sectors, investment arrangements, and other areas and sectors closely linked to business practices.

338 United Nations, Office of the High Commissioner for Human Rights, "International human rights standards and recommendations relevant to the disaggregation of SDG indicators", OHCHR working document, updated 9 April 2018, p. 6, available at https://unstats.un.org/sdgs/files/meetings/iaeg-sdgs-meeting-07/Human%20Rights%20Standards%20for%20Data%20Disaggregation%20-%20OHCHR%20-%20Background%20Document.pdf.

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- _____. *World Social Protection Report 2017-19: Universal Social Protection to Achieve the Sustainable Development Goals*. Geneva, International Labour Office, 2017. Available at https://www.ilo.org/publications/world-social-protection-report-2017-19-universal-social-protection-achieve.
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- Pickering, Jonathan, and Christian Barry. On the concept of climate debt: its moral and political value. *Critical Review of International Social and Political Philosophy*, vol. 15, No. 5 (2012), pp. 667-685. Available at https://doi:10.1080/13698230.2012.727311.

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Credit: UN DESA DISD/ Ines Belchior, Ronja Porho

Chapter 5 - Policymaking and the Rule of Law

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5.1 Introduction

With the creation of States, the governance structures and voices of Indigenous Peoples were marginalized from policy processes and the development of the rule of law, which has effectively prevented them from participating in multilateral forums. The present chapter examines the obstacles faced by Indigenous Peoples as they have fought for their place on the international stage, and it also provides examples of how they are transforming their status and engaging with increasing frequency as observers in multilateral dialogues. With Indigenous Peoples contributing to contemporary discussions on issues affecting them, space has been created for the sharing of expertise and (limited) Indigenous engagement in international forums.

The United Nations Declaration on the Rights of Indigenous Peoples references the right of Indigenous communities to participate fully in the political, economic, social, and cultural life of the State and in decision-making in matters affecting their rights; their right to maintain and develop their own decision-making institutions is also affirmed. The Declaration is acknowledged as the definitive framework for Indigenous issues, highlighting the rights of Indigenous communities in multiple spheres; in the present context, their rights with regard to climate and environmental policies are particularly relevant. Since the adoption of the Declaration, mechanisms have been created – including platforms, working groups and expert groups – that have allowed Indigenous Peoples and their representatives and institutions to join the debate. In processes aimed at addressing climate change, Indigenous Peoples have at times been able to negotiate with States on issues that affect them.

Indigenous Peoples have also been able to extend their influence into discussions that take place in broader forums but are focused on issues that relate to them. The question is whether these "special topics" spaces are sustainable. In many cases, the governance system of a convention or intergovernmental body makes the decision as to whether they will continue work in a particular area. Indigenous Peoples hope that these spaces for dialogue and decision-making with States will be consolidated and made permanent. The ultimate goal of Indigenous Peoples is to engage in direct dialogue with the representatives of Member States and gain access to decision-making processes.

5.1.1 Self-determination and the legacy of colonization

For Indigenous Peoples, "self-determination is an inherent and pre-existing right that does not derive from national laws or international law but rather is an aboriginal right".[339] Article 4 of the United Nations Declaration on the Rights of Indigenous Peoples affirms that "Indigenous Peoples, in exercising their right to self-determination, have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions".

Acts of colonization have historically been legitimized by the doctrine of discovery, an international legal principle that emerged during the early period of European imperial expansion in the fifteenth century. The doctrine allowed a nation "discovering" land to directly acquire rights to that land, even when it was already inhabited by others. It effectively authorized explorers to claim *terra nullius* ("nobody's land") when the land was not populated by Christians. Through this mechanism, non-Christian Indigenous populations were deemed

339 Leonardo J. Alvarado, "The IACHR and the right to self-determination", Debates Indígenas article, 1 February 2022, available at https://debatesindigenas.org/en/2022/02/01/the-iachr-and-the-right-to-self-determination/.

non-human and were disenfranchised, marginalized, and often displaced.[340] This ideology has long served as the foundation for the violation of Indigenous human rights.[341] The United Nations Declaration on the Rights of Indigenous Peoples affirms that colonization and resulting historic injustices have limited Indigenous Peoples' "right to development in accordance with their own needs and interests".

5.1.2 Climate negotiations: the participation of Indigenous Peoples as observers

Indigenous Peoples have witnessed the impact of climate change in the seven world regions. The Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change maintains that Indigenous communities have been seriously affected by the direct consequences of environmental degradation and the loss of ecosystems and their services.

At a gathering in Quito in May 2000, Indigenous Peoples' representatives from around the world concluded that the decisions made by the Parties to the United Nations Framework Convention on Climate Change have a profound effect on Indigenous territories, governance, and self-determination. Their concerns led to the issuance of the Quito Declaration, in which the representatives requested the Secretary of the Framework Convention "to take the necessary steps to guarantee the adequate participation of Indigenous Peoples in the Conference of the Parties … as well as in the meetings prior to the Conference and subsequent meetings".[342]

The United Nations Framework Convention on Climate Change is a multilateral process highly relevant to Indigenous Peoples, and it is within this setting that Indigenous Peoples were first able to participate formally as observers. The Second International Forum of Indigenous Peoples on Climate Change, held in The Hague in November 2000, recommended in its Declaration of Indigenous Peoples on Climate Change that the Conference of the Parties guarantee the full and effective participation of Indigenous Peoples in all activities relating to the Framework Convention through the following:[343]

- Providing Indigenous Peoples with special status in decision-making processes at the Conference of the Parties, subsidiary body meetings, and all activities carried out under the Convention;
- Establishing a working group on Indigenous Peoples and climate change with the broad participation of Indigenous representatives;
- Creating a division within the Convention secretariat dedicated to Indigenous Peoples;
- Including a permanent item on Indigenous Peoples in the agendas of the Conference of the Parties, its subsidiary bodies, and all relevant activities;
- Acknowledging Indigenous Peoples as partners and promoting meaningful consultation between Indigenous representatives and all major bodies, conventions and conferences dealing with climate change and Indigenous issues;
- Supporting access for Indigenous Peoples as equal partners at every level of decision-making in all relevant activities;
- Supporting capacity-building and the dissemination of information on the Convention and the Kyoto Protocol, including Indigenous representatives as participants in this process;
- Rejecting extractive industry and other exploitative activities in Indigenous territories and supporting protective and restorative activities for vulnerable or affected areas;
- Creating a fund to address the current and potential impacts of climate change on Indigenous Peoples.

340 Indigenous Corporate Training, Inc., "Christopher Columbus and the Doctrine of Discovery – 5 things to know", blog post, 30 March 2023, available at https://www.ictinc.ca/blog/christopher-columbus-and-the-doctrine-of-discovery-5-things-to-know.

341 United Nations, Permanent Forum on Indigenous Issues, "Study on decolonization of the Pacific region", note by the Secretariat, 20 February 2013 (E/C.19/2013/12), available at https://documents.un.org/doc/undoc/gen/n13/238/49/pdf/n1323849.pdf.

342 Representatives of Indigenous organizations and local communities, The Quito Declaration: Recommendations of Indigenous Peoples and Organizations Regarding the Process of the Framework Convention on Climate Change, para. 2, available at https://www.ciel.org/Publications/QuitoDeclaration.pdf.

343 The full text of the Declaration of Indigenous Peoples on Climate Change is available at https://www.c3.hu/~bocs/eco-a-1.htm; see section III for most of these recommendations. See also the International Indigenous Peoples Forum on Climate Change website (https://www.iipfcc.org/).

Some of these recommendations have been partially implemented over the past couple of decades. There have also been various achievements and challenges in other spaces surrounding the Framework Convention.

5.1.3 Pursuing equity in a context of inequity

The Nairobi work programme on impacts, vulnerability, and adaptation to climate change, established in 2005 at the eleventh Conference of the Parties to the United Nations Framework Convention on Climate Change, is mandated to incorporate Indigenous Peoples' scientific and traditional knowledge into its activities.[344] This is the first programme within the Convention that has integrated traditional knowledge in climate adaptation discussions and processes. Its inclusion is due in large part to the advocacy of Indigenous leaders from Canada, who participated in the process as part of the official delegation of the Canadian Government. Indigenous Peoples from the seven sociocultural regions expressed their deep appreciation for these efforts and their successful outcome.

Despite the extension of an open invitation to contribute to the Nairobi work programme, Indigenous Peoples have largely been unable to participate due to a lack of resources. There has been even less support available to generate evidence (through reports and case studies) that could enhance the work of the programme. The lack of access to resources has continued to limit the involvement of Indigenous Peoples in Convention activities, though some non-governmental organizations have provided assistance by conducting small studies that have helped strengthen Indigenous Peoples' proposals.

Since the creation of the Local Communities and Indigenous Peoples Platform, set up in 2015 to facilitate the exchange of knowledge, some resources have been allocated to help fund the participation of knowledge holders and youth in climate negotiations.

5.1.4 New forms of colonization of Indigenous Peoples' lands, territories and resources

Since the start of the millennium, with the designation of large areas of land as carbon sinks, Indigenous Peoples have expressed their concerns over the shrinking of their territories and the disregard shown by State and corporate entities for the value and sacredness of traditional lands and resources for Indigenous communities. With the resurgence of carbon markets under the Paris Agreement, Indigenous Peoples are actively advocating for the recognition and enforcement of their rights; for guaranteed compliance with the principle of free, prior and informed consent; and for their participation and inclusion in the evaluation of proposals within the relevant committees.

5.1.5 The reactions of Indigenous Peoples to encroachment on their territories

At the national level, Indigenous Peoples face serious challenges in their territories. In many cases, State energy policies are not aligned with nationally determined contribution (NDC) commitments. Activities carried out by the mining, logging, oil, and hydroelectric energy industries directly affect the territories of Indigenous Peoples and contribute significantly to greenhouse gas emissions.

Indigenous Peoples have sued States and in some instances have succeeded in halting initiatives jeopardizing their territorial governance rights. In the Mayagna (Sumo) Awas Tingni Community versus Nicaragua case, which addressed the legalities surrounding a State-granted timber concession in Indigenous territories,[345] the Inter-American Court of Human Rights ordered the Government of Nicaragua to demarcate and title the traditional lands of the Awas Tingni Peoples in accordance with their customary laws,

344 United Nations Framework Convention on Climate Change secretariat, "Nairobi work programme", available at https://www4.unfccc.int/sites/nwpstaging/Pages/NWP-knowledge-resources.aspx.

345 Inter-American Court of Human Rights, Case of the Mayagna (Sumo) Awas Tingni Community v. Nicaragua, merits, reparations and costs, IACHR Series C, No. 79, IACHR 9, IHRL 1462, 31 August 2001, available at https://www.corteidh.or.cr/docs/casos/articulos/seriec_79_ing.pdf.

norms, and land tenure and resource rights.[346] In the Saramaka People versus Suriname case, which involved logging and mining concessions that violated the right of Indigenous communities to use and enjoy their ancestral territory,[347] the Court determined that the State had failed to adopt domestic legal provisions that protected and guaranteed the rights of the Peoples of Sarawak.[348]

5.2 Indigenous Peoples and international agreements: recognition of their participation in decision-making

When the first international environmental agreements were being concluded at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, Indigenous Peoples called upon States to hear their voices and acknowledge the potential benefits of Indigenous knowledge and input. Their appeal was answered, and in the Rio Declaration on Environment and Development, principle 22 recognizes the vital role of Indigenous Peoples and their traditional knowledge and practices in the conservation and sustainable management of the environment.[349] Since then, three major environmental agreements have emerged, and two of them – the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change – have been of particular interest to Indigenous Peoples.

Since these multilateral spaces were created at the State level, Indigenous Peoples have participated only as observers, with no avenue for direct influence. Over time, Indigenous Peoples have seen the need to expand and strengthen their level of engagement, as there are many State decisions that directly affect them.

5.2.1 United Nations Framework Convention on Climate Change: the Paris Agreement

After the lack of full compliance with the requirements of the Kyoto Protocol, the Paris Agreement became one of the most important instruments addressing global climate change. More than 300 Indigenous Peoples' organizations (representing all seven of the world's sociocultural regions) participated in the twenty-first session of the Conference of the Parties in 2015, and they played an important role in the final decisions surrounding the Paris Agreement.[350] Since 2000, the participation of Indigenous Peoples in the Convention meetings has received solid support.

For many years, Indigenous Peoples' delegates have debated whether to participate as part of official government delegations. Some opt to do so, reasoning that this improves the chances of their views being included in official government positions. Others believe that they will not be able to influence their official delegations and that their representation is therefore limited to official government positions. Experience has shown that in some instances, the participation of Indigenous Peoples in official delegations has provided access to closed negotiations, effectively advancing the positions and extending the influence of Indigenous Peoples.

346 United Nations Environment Programme, Law and Environment Assistance Programme, "The case of the Mayagna (Sumo) Awas Tingni Community v. Nicaragua" (2001), case summary and link to full text available at https://leap.unep.org/en/countries/ni/national-case-law/case-mayagna-sumo-awas-tingni-community-v-nicaragua.

347 Inter-American Court of Human Rights, Case of the Saramaka People v. Suriname, interpretation of the judgment on preliminary objections, merits, reparations and costs, IACHR Series C, No. 185, IHRL 3058 (IACHR 2008), 12 August 2008, available at https://www.corteidh.or.cr/docs/casos/articulos/seriec_172_ing.pdf.

348 Ibid.

349 Convention on Biological Diversity, "Rio Declaration on Environment and Development", full text of declaration available at https://www.cbd.int/doc/ref/rio-declaration.shtml.

350 International Indigenous Peoples' Forum on Climate Change, "Indigenous Peoples' Pavilion at COP 21", available at https://iipfcc.squarespace.com/cop21.

Waorani woman from the Amazon.
Credit: Mirian Masaquiza Jerez

5.2.1.1 The negotiation of Indigenous Peoples' rights for the Paris Agreement

The adoption of the United Nations Declaration on the Rights of Indigenous Peoples established a baseline for the protection of Indigenous rights. Throughout the negotiations for the Paris Agreement, delegates representing Indigenous Peoples advocated for the incorporation of their rights and the recognition of the Declaration within the Agreement. The Party negotiators from various countries exercised caution but agreed to include provisions that acknowledged State obligations with regard to the rights of Indigenous Peoples.[351] In the Cancun Agreements, adopted in 2010,[352] appendix I includes a subsection on promoting and supporting respect for the knowledge and rights of Indigenous Peoples "by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples".

The International Indigenous Peoples' Forum on Climate Change (IIPFCC), a caucus for Indigenous Peoples participating in Convention processes, played a significant representative role for Indigenous Peoples in the Paris Agreement negotiations. There were three main demands from Indigenous Peoples: reference to the United Nations Declaration on the Rights of Indigenous Peoples, recognition of "Indigenous Peoples' knowledge" or (as some representatives advocated) "traditional knowledge", and the creation of a working group on Indigenous Peoples and climate change. Because of this advocacy, the following was achieved:

- Although recognition of the United Nations Declaration on the Rights of Indigenous Peoples is not incorporated in the Paris Agreement, the rights of Indigenous Peoples are articulated in preambular paragraph 11: "Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of Indigenous Peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity."
- Article 7(5) of the Paris Agreement refers to the role of "traditional knowledge, knowledge of Indigenous Peoples and local knowledge systems" in guiding climate adaptation action, reflecting recognition of the legitimacy of such knowledge alongside "the best available science". The full paragraph reads as follows: "Parties acknowledge that adaptation action should follow a country-driven, gender responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of Indigenous Peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate". The inclusion of Indigenous Peoples in official delegations led to a substantial change in the discourse surrounding Indigenous Peoples' knowledge, and the wording and content of the paragraph reflect that shift.
- The Local Communities and Indigenous Peoples Platform was established. The broad participation of Indigenous Peoples in its creation and operationalization is discussed below. It should be mentioned that Indigenous Peoples originally supported the creation of a broad working group on climate change that would have provided opportunities for more direct negotiations with States. What was eventually approved was the establishment of a platform for building and sharing the knowledge of local Indigenous communities.

351 United Nations Framework Convention on Climate Change, Conference of the Parties, Paris Agreement, adopted 12 December 2015, *Treaty Series*, vol. 3156, available at https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en; references to Indigenous Peoples are found in the preamble and article 7(5).

352 United Nations Framework Convention on Climate Change, "Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010", addendum – part two: action taken by the Conference of the Parties at its sixteenth session, contents – decisions adopted by the Conference of the Parties, "The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term cooperative Action under the Convention", decision 1/CP.16, 15 March 2011 (FCCC/CP/2010/7/Add.1), available at https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf.

5.2.1.2 The mechanism approved to enhance Indigenous Peoples' participation

In the discussions leading up to the Paris Agreement, Indigenous leaders proposed the creation of a working group on climate change and Indigenous Peoples. The working group would allow experts from Indigenous communities and States to come together and offer solutions to meet the objectives of the Convention. This proposed mechanism was essentially a replication of the Working Group on Article 8(j) of the Convention on Biological Diversity, which incorporates a system of negotiation between States and Indigenous Peoples aimed at enhancing the role and involvement of the latter in achieving the Convention objectives.[353] However, the secretariat of the United Nations Framework Convention on Climate Change reiterated in several communications, including to the secretariat of the United Nations Permanent Forum on Indigenous Issues, that this would not work for the Framework Convention.

Facilitated through Member States supportive of Indigenous issues, the Parties met with IIPFCC members and proposed the creation of a forum modelled on the United Nations Permanent Forum on Indigenous Issues in which all would participate. Paragraph 135 of the Paris Agreement, acknowledging the need to leverage Indigenous knowledge, technologies, and best practices, creates a platform for the sharing of information and experiences. In this paragraph, the Conference of the Parties "recognizes the need to strengthen knowledge, technologies, practices and efforts of local communities and Indigenous Peoples related to addressing and responding to climate change, and establishes a platform for the exchange of experiences and sharing of best practices on mitigation and adaptation in a holistic and integrated manner".

The outcome did not align with the original intentions of Indigenous Peoples, but it represented what was attainable at that time as a result of extensive dialogues with supportive Member States. Seizing this opportunity was crucial, and the creation of the platform received IIPFCC backing.

5.2.1.3 Facilitative Working Group

In paragraph 10 of its decision 2/CP.23, the Conference of the Parties called for further operationalization of the platform through the establishment of a facilitative working group and modalities for the development of a relevant workplan to facilitate the implementation of its functions relating to knowledge, capacity for engagement, and climate change policies and actions.[354] However, it was emphasized that the working group "would not be a negotiating body under the Convention", a decision initially challenged by Indigenous Peoples' representatives but ultimately accepted. The Facilitative Working Group of the Local Communities and Indigenous Peoples Platform was duly established at the twenty-fourth session of the Conference of the Parties in December 2018.

The IIPFCC members were concerned when the Convention secretariat invited only members of the Facilitative Working Group to various meetings of the Convention working bodies, leaving out IIPFCC members. This was eventually resolved, and today the participation of many members of the IIPFCC is much broader.

The Facilitative Working Group reports contain a wealth of information generated by Indigenous Peoples' representatives and institutions. The reports are ultimately reviewed and adopted by the Subsidiary Body for Scientific and Technological Advice, one of the two permanent subsidiary bodies supporting and contributing to the work of the Convention.

5.2.1.4 The three agreed functions of the Platform

The agreed functions of the Platform are knowledge-sharing, capacity-building, and policy development.

Under the first function, Indigenous Peoples have dealt with two internal questions: What can they share, given that many of their knowledge systems are locally protected? and Should Indigenous Peoples create safeguards for what they decide to share externally?

353 Convention on Biological Diversity, "Working Group on Article 8(j)", available at https://www.cbd.int/convention/wg8j.shtml.

354 United Nations Framework Convention on Climate Change, "Report of the Conference of the Parties on its twenty-third session, held in Bonn from 6 to 8 November 2017", addendum, part two: action taken by the Conference of the Parties at its twenty-third session, decisions adopted by the Conference of the Parties (see decision 2.CP/23, para. 10), 8 February 2018 (FCCC/CP/2017/11/Add.1), available at https://unfccc.int/documents/65126.

Under the second function, beyond learning more about the workings of the Convention and how to involve Indigenous Peoples in its activities, the idea has been to educate the Parties' negotiators about the rights of Indigenous Peoples and how important Indigenous knowledge systems are to climate action.

The third function of policy development has not been undertaken, mainly because policies are made and must be applied at the national level. However, this is an issue that Indigenous Peoples want to raise in the next Platform workplan.

5.2.1.5 Development of the Platform workplan

The Platform workplan is prepared by the Convention secretariat team based on the recommendations of Indigenous Peoples. A key aspect of the process is that during the meetings of the Facilitative Working Group, IIPFCC representatives can recommend topics for inclusion in the document. This open opportunity to contribute is extremely important for building a consensus-based workplan. Notably, growing numbers of Indigenous women and youth have been directly involved in presenting recommendations to highlight the need for their own space in the workplan.

Most Indigenous Peoples' representatives believe that an institutional framework should be created at the national level to advance the functions of the Platform, with the direct participation of knowledge holders from Indigenous communities. Relevant institutions could be created within the respective Indigenous organizations or groups and made public in order to facilitate the exchange of knowledge.

5.2.1.6 Nationally determined contributions, the Paris Rule Book, and Indigenous Peoples

What is colloquially referred to as the Paris Rulebook was adopted in 2018 at the twenty-fourth session of the Conference of the Parties in Katowice, Poland. The Rulebook includes detailed rules and procedures for implementing the Paris Agreement, providing guidance on what countries should consider when developing national plans to combat climate change. During the negotiations, Indigenous Peoples managed to incorporate certain elements into the rules governing NDCs.

Provisions within the Rulebook call for the participation of Indigenous Peoples in planning processes undertaken to prepare NDCs, and the guidelines list traditional knowledge, knowledge of Indigenous Peoples, and local knowledge systems related to adaptation among the elements that may be included in national adaptation communications. There is a clear expectation of Indigenous involvement in national climate planning (particularly through knowledge-sharing) and of mention of this involvement in adaptation reporting processes. However, attention to these provisions has not been reflected in the most recent Member State NDC reports.

In spite of these efforts to incorporate Indigenous participation and knowledge in climate action, subsequent analyses reflect a continued lack of government recognition of Indigenous needs and priorities – and of the potential contribution of Indigenous Peoples to climate change mitigation and adaptation. The implementation of all provisions of the Paris Agreement should be reflected in the NDCs, including obligations relating to Indigenous engagement. Many countries have not addressed Indigenous issues in the original or updated versions of their NDCs, but the situation appears to be improving; the proportion of countries making reference to Indigenous Peoples rose from 22 per cent in the first round of NDC submissions to 38 per cent in the second round. Rosario Carmona and others have found that the five topics receiving increased attention in the NDCs include Indigenous knowledge, Indigenous jurisdiction, full and effective participation, Indigenous Peoples as rights holders, and colonialism.[355] In addressing this last topic relative to the NDCs, Carmona summarizes that "the dynamics of colonialism have not only pushed Indigenous Peoples into scenarios of increased vulnerability associated with the biophysical impacts of climate change but have also subjected them to climate policies – and especially mitigation policies – that intervene in their territories and even violate their rights".[356]

355 Rosario Carmona and others, "Recognition of Indigenous Peoples in nationally determined contributions: IWGIA submission – inputs to the first global stocktake, October 2022" (International Work Group for Indigenous Affairs, 2022), available at https://unfccc.int/documents/626618.
356 Ibid., pp. 19-20.

UNPFII Member at COP26 UNFCCC. Credit: Mirian Masaquiza Jerez

5.2.1.7 The participation of Indigenous Peoples in Convention activities

In the 2023-2027 workplan of the Technology Executive Committee,[357] the policy arm of the Technology Mechanism, Indigenous Peoples have been invited to participate in 16 activities associated with the four workstreams. The IIPFCC has nominated participants based on gender balance and regional representation but has not yet received any news on the details surrounding this participation as it is a new opportunity. The invitation was extended in 2023 and has the potential to expand the discourse on Indigenous Peoples and their work.

As alluded to earlier, the participation of a wider range of Indigenous Peoples in the different Convention bodies and activities has been made possible by the demands of Indigenous representatives that participation not be limited to members of the Facilitative Working Group but rather broadened to include members of the global caucus representing the different regions. There had been an assumption that Indigenous Peoples would raise

357 United Nations Framework Convention on Climate Change, "Workplan", available at https://unfccc.int/ttclear/tec/workplan#:~:text=Technology%20Executive%20Committee%20workplan%202023%E2%80%932027&text=The%20TEC%20strives%20to%20do,actions%20and%20cultivating%20collaborative%20partnerships.

issues and channel their concerns solely through the Local Communities and Indigenous Peoples Platform, but the IIPFCC identified the Platform as just one space dealing with Indigenous Peoples' knowledge. The IIPFCC continues to work towards opening up opportunities in other United Nations Framework Convention on Climate Change bodies and mechanisms to discuss the topics affecting Indigenous Peoples.

The participation and recognition of Indigenous Peoples has evolved from the complete absence of any reference to Indigenous Peoples in the year 2000 to the achievement of NGO observer status and the acknowledgement of their rights under the Paris Agreement. Their request to create a working group was key, leading to the establishment of the Platform and its Facilitative Working Group. These developments have opened the door to the increased participation of Indigenous Peoples in global climate action and other priority areas.

5.2.2 Convention on Biological Diversity: International Indigenous Forum on Biodiversity and its working groups

Indigenous Peoples started out with more formal participation in processes linked to the Convention on Biological Diversity than in those associated with other global climate instruments; this Convention has served as a model to follow and modify as needed. In advocating for the adoption of effective participation mechanisms, Indigenous representatives involved in negotiations around the United Nations Framework Convention on Climate Change were guided by the experience of their colleagues working with the Convention on Biological Diversity. Indigenous participation in the latter began in 1996 and has opened up many spaces for the active engagement of Indigenous Peoples. Indigenous representatives operating under this Convention are organized around the International Indigenous Forum on Biodiversity, which has a clear structure for dealing with biodiversity topics. A total of eight working groups have been created to support Forum activities; the one established most recently focuses on resource mobilization.[358]

In 1998, the Ad Hoc Open-ended Working Group on Article 8(j) and Related Provisions was established by the Parties "to respect, preserve and maintain the knowledge, innovations and practices of Indigenous Peoples and local communities relevant for the conservation of biodiversity". A programme of work was launched in 2000 to implement article 8(j) commitments and other Convention objectives and has since been updated. Significant work has been carried out under this programme, including the adoption of five voluntary guidelines.[359] Article 8(j) provisions have been a main focal point for Indigenous Peoples and have influenced national legislation in a number of countries. There are Indigenous Peoples who are article 8(j) experts and provide support for government initiatives at the national level.

Indigenous representatives are also involved in the Ad Hoc Open-ended Working Group on Access and Benefit-sharing from the Use of Digital Sequence Information on Genetic Resources and the Ad Hoc Open-ended Working Group on Protected Areas; the latter is especially important considering the impacts of protected areas on Indigenous Peoples' territories and governance systems. There is active Indigenous involvement in other areas as well, including activities around the implementation of article 10(c), which deals with the sustainable use of components of biodiversity.

5.2.2.1 A new global biodiversity framework

In 2020, the secretariat of the United Nations Convention on Biological Diversity released the first draft of a new global biodiversity framework requested during the fourteenth meeting of the Conference of the Parties (COP 14) in 2018. It was acknowledged that the implementation of such a framework would require the engagement of actors beyond Governments – including NGOs, Indigenous Peoples and local communities, women's groups, youth, and the business and finance communities – to build momentum for success.

358 International Indigenous Forum on Biodiversity, "One voice for Mother Earth", available at https://iifb-indigenous.org/.
359 Convention on Biological Diversity, "Working Group on Article 8(j)", available at https://www.cbd.int/convention/wg8j.shtml.

Implementation would take a rights-based approach.[360] The framework was further refined by various Convention bodies before being presented for consideration during the second part of the fifteenth meeting of the Conference of the Parties (COP 15), held in Montreal in December 2022.

During COP 15, Indigenous Peoples participated actively in deliberations on issues of interest to them – including priorities attached to the new biodiversity framework. Their participation began with a well-organized coordination process within the International Indigenous Forum on Biodiversity, where the delegates distributed the work of advocacy on the various issues.

Each select group representing Indigenous Peoples presented their proposals at official meetings with the representatives of the Parties. This marked a significant advance in terms of Indigenous engagement, as anyone could take the floor without any restriction; indeed, Indigenous representatives were requested to take the floor to present their views. In the many meetings that were held, representatives of both the Parties and Indigenous groups had multiple opportunities to comment on topics of interest.

The Kunming-Montreal Global Biodiversity Framework was adopted on 19 December 2022, on the final day of the COP 15 meeting. It incorporates four long-term goals for 2050 and 23 action-oriented targets for 2030. Some of the targets address the specific needs of Indigenous Peoples; those integrating the language proposed by Indigenous representatives are summarized below.

- Respect the rights of Indigenous Peoples in the spatial planning and effective management of biodiverse areas (target 1) and in the conservation and management of at least 30 per cent of biodiverse areas (target 3).
- Recognize and respect Indigenous Peoples' territories in the creation and maintenance of conservation areas in high biodiversity zones (target 3). Here there was some opposition to any further expansion of protected areas that would damage Indigenous territories. Indigenous Peoples are mainly interested in avoiding the historical conflicts created by protected areas.
- Respect, protect, and encourage the customary sustainable use of native species by Indigenous Peoples while developing legal measures to prevent the overexploitation and ensure the management of these species (targets 5 and 9).
- Funds should be made available to support the collective role of Indigenous Peoples in the implementation of biodiversity strategies and action plans (target 19).
- When decisions need to be made, the knowledge, innovations, practices and technologies of Indigenous Peoples should be recognized and accessed through free, prior and informed consent, in accordance with national legislation (target 21). The note for this target is important, since it equates free, prior and informed consent with "approval and involvement".[361]
- Ensure the full and effective participation and representation of Indigenous Peoples in biodiversity decisions (target 22). This highlights the requirement for Indigenous involvement in decision-making, though how it will be implemented is as yet uncertain.

5.2.2.2 The Global Biodiversity Framework Fund

Target 19 of the new Global Biodiversity Framework calls for a substantial and progressive increase in funding to support the implementation of national biodiversity strategies and action plans; the collective role of Indigenous Peoples within this context is highlighted in subparagraph (f). The target calls for the mobilization of at least $200 billion per year through various means and for multiple purposes; one of the key strategies for mobilizing biodiversity-related resources is increasing international development assistance to at least $20

360 Convention on Biological Diversity, "A new global framework for managing nature through 2023: first detailed draft agreement debuts", available at https://www.cbd.int/article/draft-1-global-biodiversity-framework. The first draft was developed during the 2020 session; the new instrument was adopted at two years later, at COP 15.

361 Convention on Biological Diversity, "COP15: final text of Kunming-Montreal Global Diversity Framework", available at https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222.

billion per year by 2025 and at least $30 billion per year by 2030.

The Global Biodiversity Framework Fund, established at the seventh assembly of the Global Environment Facility in 2023, is dedicated to supporting the implementation of the Kunming-Montreal Global Biodiversity Framework. Funding will be provided by multiple sources and rapidly distributed through streamlined procedures, "with enhanced access for Indigenous Peoples and local communities, according to their own priorities". The Fund will be available until 31 December 2030 unless a decision is made to extend it.[362]

There are high expectations from Indigenous Peoples, who have long demanded direct access to finance (with no intermediaries). There is a firm belief that direct funding is needed to advance Indigenous biodiversity efforts, including the production of evidence-based reports to support Indigenous positions. The aspiration of Indigenous Peoples is to have at least 20 per cent of these funds for their own initiatives.

Given the significant gains that have been achieved – including Indigenous engagement in the negotiations of the Convention on Biological Diversity, increased recognition of the crucial role played by Indigenous Peoples in safeguarding and preserving biodiversity, and the new provisions regarding more streamlined access to financial resources – it is surprising that the involvement of Indigenous representatives in the Board of the Fund was not approved. Their participation was included in the initial draft of the new funding mechanism but not in the final version.

5.3 Constitutions, laws, and nationally implemented global mechanisms supporting Indigenous environmental action

In national constitutions and laws that address the rights of Indigenous Peoples, relevant provisions vary widely in terms of content, scope and enforcement. Global initiatives often prompt action at the national level, which can provide more domestic exposure to Indigenous issues, particularly those relating to the environment. This increased visibility may lead to constitutional revisions or legislative modifications that reflect increased support. Existing constitutions and laws that already include provisions addressing these issues may strengthen domestic action, allowing Indigenous voices to be heard.

In South America, some constitutions include a chapter on Indigenous Peoples. However, most of the constitutional principles have not been implemented appropriately in national policies, often because there is a lack of understanding within the State bureaucracy. National mechanisms can be established to provide more exposure to Indigenous issues and greater recognition of Indigenous needs and priorities. These mechanisms are most effective when they include a mix of public and private sector actors. In 2008, the Forest Carbon Partnership Facility[363] was launched with the involvement of 47 countries, with participants including representatives from the private sector, government, civil society, and Indigenous Peoples' organizations. As part of this initiative, national roundtables were created to address environmental priorities such as reducing emissions from deforestation and forest degradation in developing countries, REDD+ issues, and climate change; in many cases, Indigenous representatives were invited to participate. Later, the adoption of instruments such as the Paris Agreement led to the strengthening of these roundtables. A number of Latin American countries were actively involved in this process, as exemplified by the creation of the Indigenous Table on Climate Change in

362 Convention on Biological Diversity, "Launch of the Global Biodiversity Framework Fund", available at https://www.cbd.int/article/launch-global-biodiversity-framework-fund; Global Environment Facility, "New global biodiversity fund launched in Vancouver", press release, 24 August 2023, available at https://www.thegef.org/newsroom/press-releases/new-global-biodiversity-fund-launched-vancouver.

363 Forest Carbon Partnership Facility, "About the PCPF", available at https://www.forestcarbonpartnership.org/about.

Maori participant at the 22nd session of the UNPFII. Credit: Robert Bane

Guatemala.[364] Over the years, Indigenous perspectives have been incorporated in national legislation on climate change in various countries in the region, often promoting dialogue and the establishment of support mechanisms. A few examples are provided below.

- In the Plurinational State of Bolivia, the 2012 Framework Law of Mother Earth and Integral Development for Living Well incorporates the vision and concepts of Indigenous Peoples.[365] Their participation is key to its implementation. This legislation inspired the creation of a national platform for knowledge exchange, which inspired the establishment of another platform at the regional level.
- In Peru, the 2018 Framework Law on Climate Change includes many references to Indigenous Peoples.[366] It recognizes their knowledge, promotes their participation in the implementation of the Framework Law, and acknowledges that they should be the beneficiaries of emission reduction projects. The Law proposes an action plan to address forced migration due to climate change. The Government is working with Indigenous Peoples through roundtables to implement this legislation.
- In 2022, Chile adopted the Framework Law on Climate Change,[367] which acknowledges the need to consult Indigenous Peoples in public participation processes.

364 LATINNO – Innovations for Democracy in Latin America, "Indigenous Table on Climate Change in Guatemala" (2011-2015), available at https://latinno.net/en/case/10073/.

365 Gaceta Oficial del Estado Plurinacional de Bolivia, Ley Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien, Ley No. 300, Ley de 15 de Octubre de 2012, available at https://faolex.fao.org/docs/pdf/bol117451.pdf.

366 Peru, Ministerio de Ambiente, Ley Marco Sobre Cambio Climático y Su Reglamento, Ley No. 30754, available at https://cdn.www.gob.pe/uploads/document/file/1230066/200812_Ley_Marco_sobre_Cambio_Clim%C3%A1tico.pdf.

367 Chile, Ministerio del Medio Ambiente, Ley Marco de Cambio Climático, Ley 21455, promulgación 30 May 2022, publicación 13 June 2022, available at https://www.bcn.cl/leychile/navegar?idNorma=1177286&idParte=10341110&idVersion=2022-06-13.

Various African countries also have constitutional and legislative provisions in place to address the needs of Indigenous Peoples and relevant environmental priorities. As illustrated by the examples below, having formal national mechanisms in place can expedite the implementation of global guidelines and directives supporting Indigenous rights.

- The Democratic Republic of the Congo has faced challenges in the implementation of the Cancun safeguards for REDD+, but recent developments may help move this process forward.[368] At the time the safeguards were adopted, there was some misalignment between national laws and the safeguard provisions, and expectations were not being met with regard to Indigenous Peoples. In 2022, the Government made history with the adoption of the Law for the Protection and Promotion of the Rights of Indigenous Pygmy Peoples – the first national legislation recognizing the customary rights of Indigenous communities. A decade was spent advocating for this legislation, and the country now faces the challenge of implementing its many provisions for the benefit of Indigenous Pygmy Peoples. Among other things, this new legislation recognizes their traditional conservation methods and aims to integrate their knowledge into national conservation strategies.[369]
- Indigenous Peoples in Kenya have played a significant role in the preparation of the national REDD+ strategy from the start, which is genuinely noteworthy. The Government has held numerous dedicated meetings with Indigenous Peoples to obtain their valuable input and strengthen the validation of the entire process. Two key achievements have been the acknowledgment of Indigenous Peoples' expertise in forest management and the establishment of the Indigenous Peoples Technical Reference Group on REDD+. This proactive support for Indigenous involvement is a direct outcome of the new constitution, which has been in effect since 2010. The Constitution of Kenya specifically addresses the issue of general property rights and land tenure rights, including the recognition of "community tenure rights over certain types of forests, and the rights of Indigenous Peoples, forest communities, and local communities".[370]

5.4 Conclusions

Indigenous Peoples have worked tirelessly to make their voices heard in decision-making processes during international negotiations. The main challenge has been that ultimate decision-making power within the principal multilateral forums lies with the States.

As evidenced by the examples provided in this chapter, Indigenous Peoples have employed different approaches, adopted targeted measures, and utilized diverse mechanisms to enhance their participation in these important global spaces.

The formation of working groups that include experts representing States and Indigenous Peoples has created opportunities for more specialized discussions and has enabled the compilation of reports that have been adopted by bodies operating within the convention governance systems.

5.4.1 Enhanced participation

With the expert working groups promoting and enabling targeted discussions, Indigenous Peoples' representatives have the opportunity to offer commentary from both their own perspective and a broader regional standpoint. This direct engagement strengthens the reports that serve as inputs to the decision-making arm of specialized convention bodies such as the Subsidiary Body for Scientific and Technological Advice, which carries out the methodological work under the United Nations Framework Convention on Climate Change. If the reports prepared for higher-level decisions are approved,

368 The safeguards are detailed in United Nations Framework Convention on Climate Change Decision 1/CP.16, annex I, para. 2.
369 International Work Group for Indigenous Affairs, "Indigenous Peoples in the Democratic Republic of Congo", available at https://www.iwgia.org/en/democratic-republic-of-congo/5350-iw-2024-drc.html.
370 Robert Kibugi, *Local Communities' and Indigenous Peoples' Land and Forestry Rights: Assessing the Law and Practice on Tenure Security in Kenya*, Occasional Paper, No. 222 (Bogor, Indonesia, Center for International Forestry Research, 2021), available at https://www.cifor-icraf.org/publications/pdf_files/OccPapers/OP-222.pdf.

the need for Indigenous representatives to participate directly in decision-making processes may be diminished or obviated.

5.4.2 Sustainability of discourse spaces

There are concerns over the fact many of the spaces in which Indigenous Peoples are most actively involved are not permanent or open-ended but rather tied to time-bound objectives. The Local Communities and Indigenous Peoples Platform, established through the Paris Agreement to facilitate the exchange of knowledge, has been a key motivator for active Indigenous engagement; however, it is not known how long this mechanism will be in place. Spaces such as these have proved transformative in the realm of Indigenous advocacy and are worth replicating, but their potential transience needs to be addressed, as institutional stability is essential for strong Indigenous representation.

5.5 Recommendations

- To strengthen the participation of Indigenous Peoples in multilateral dialogues, it is recommended that specialized groups be established for various priority areas. These groups should take an interdisciplinary approach, promoting the genuine integration of Western and Indigenous scientific and technical knowledge in addressing the climate crisis and other environmental challenges. Having dedicated discourse spaces will ensure that Indigenous perspectives and knowledge systems are valued and respected in international decision-making and will allow Indigenous Peoples to contribute meaningfully and effectively to adaptation and mitigation efforts.
- Already a growing trend in recent years, it is recommended that the presence and role of Indigenous Peoples in official government delegations be strengthened. Increased integration in State delegations has allowed Indigenous Peoples to exercise greater influence, as their inclusion provides opportunities for Indigenous perspectives and priorities to be shared and later incorporated in the official positions of countries during negotiations.
- The global environmental policies adopted under the principal conventions have encouraged the creation of national participatory spaces for Indigenous Peoples, allowing them to contribute to policy design at the country and local levels. States should continue to create spaces in which Indigenous Peoples are valued and heard and can play a meaningful role in advancing climate solutions. Sustained support will encourage increased participation among Indigenous Peoples, creating a virtuous cycle of awareness, engagement and advocacy.
- It is crucial that Indigenous Peoples be provided with direct access to climate funds to ensure that their needs and perspectives are adequately represented in climate action. It is particularly critical that dedicated funds be made available to support research by and for Indigenous Peoples, as this will strengthen their capacity to develop innovative and culturally appropriate solutions that contribute meaningfully to climate change mitigation and adaptation.

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