Indigenous Curricula and Materials Related to Climate Change

Activity 3 of the 2022-2024 LCIPP Workplan

Literature Review

27 February 2025

Executive summary

This literature review on Indigenous curricula and educational materials related to climate change examines the development and incorporation of Indigenous knowledge into formal and informal education systems. It highlights how Indigenous knowledge contributes to holistic climate change mitigation and adaptation strategies and collective stewardship of nature. The review draws on diverse resources, including case studies, publications, storytelling, and community practices shared through the Local Communities and Indigenous Peoples Platform (LCIPP) work, including the LCIPP web portal and relevant events.

This document explores frameworks and examples of how Indigenous knowledge is incorporated into educational systems, including intergenerational knowledge transmission, Indigenous language education, and the ethical use of Indigenous resources. The document outlines the existing guidelines of free, prior, and informed consent (FPIC), equitable engagement protocols, and the inclusion of gender-sensitive practices in the development and application of Indigenous curricula. Finally, this review proposes ways to incorporate into the implementation of the Baku Workplan of the LCIPP, and identify opportunities for educators, policymakers, and researchers to enhance the ethical and equitable incorporation of Indigenous knowledge into educational systems, thus contributing to holistic climate action and collective nature stewardship.

Abbreviations and Acronyms

AIIKS	African Institute in Indigenous Knowledge Systems
ACE	Action for Climate Empowerment
FPIC	Free, Prior, and Informed Consent
FWG	Facilitative Working Group of the Local Communities and Indigenous Peoples Platform
IIU	Indigenous Intercultural University
IPCC	Intergovernmental Panel on Climate Change
LCIPP	Local Communities and Indigenous Peoples Platform
MOOC	Massive Open Online Course
REU	Midwest CASC Tribal Research Experience
WINHEC	World Indigenous Nations Higher Education Consortium

I. Background and Mandate

a. Context of the 2022-24 LCIPP Workplan Activity 3

Activity 3 under the 2022-2024 LCIPP workplan calls for continued effort "to identify and disseminate substantive information about development and use of curricula and materials generated by Indigenous peoples related to climate change that highlight Indigenous knowledge in formal and informal education systems, including guidelines on ethical and equitable use of such resources, and disseminate the results via the LCIPP web portal." [1]

Deliverables under this activity include a "call for submissions and a survey for sharing relevant practices and stories in diverse formats, including written case studies, short videos, photo stories and voice recordings, as appropriate, in accordance with the substantive and procedural elements of the right to free, prior and informed consent." These submissions, along with other resources shared via the LCIPP web portal, form the basis for preparing this literature review, as detailed in the next section on the scope of this review.

b. Indigenous Knowledge and Climate Leadership

Research and global policy discussions increasingly recognize the leadership of Indigenous Peoples and local communities in addressing global climate change and nature stewardship.[2] Across diverse geographical contexts, Indigenous communities manage, occupy, or hold tenure rights to over a quarter of the world's land surface, including a large proportion of the planet's remaining intact forests (IPBES, 2019). These territories are recognized not only for their ecological richness but also for the reciprocal stewardship practices guided by the values and worldviews of Indigenous Peoples (Sobrevila, 2008).

Central to Indigenous approaches is the principle of reciprocity. Rather than perceiving humanity and the environment as separate entities, Indigenous philosophies emphasize a mutual, life-sustaining relationship with the land, waters, and living beings. This worldview underscores that human well-being is intimately connected to ecological integrity, thereby aligning resource management with long-term sustainability. Studies show that such reciprocal land-use practices maintain biodiversity more effectively than many conventional conservation strategies (McElwee et al. 2019).

Another important value of Indigenous climate leadership lies in its intergenerational perspectives, best captured in the seventh-generation principle, ensuring that decisions made today do not compromise the wellbeing of future generations. By weaving together intergenerational knowledge and wisdom, transmitted through diverse communication channels as highlighted in this review, Indigenous Peoples forge resilience strategies that can enrich holistic climate adaptation and mitigation action. [3]

II. Scope

The term "Indigenous curricula," as used in the LCIPP Workplan, refers to "curricula created, composed, and upheld by Indigenous Peoples, whether recently or in ancestral times, that reflects generational place-based knowledge, Indigenous language, and other elements of an Indigenous worldview and culture." [4]

In alignment with the mandate (as described in Section I above), this review covers:

a. Relevant materials in diverse formats shared through the LCIPP web portal.
b. Contributions and recommendations from FWG members and other LCIPP contributors, including those submitted through the UNFCCC portal and shared during the mandated LCIPP events.
c. Relevant literature, including IPCC assessment reports.

III. Development and Use of Indigenous Curricula and Materials in Informal and Formal Educational Systems

The FWG recognizes that the knowledge and ways of knowing of Indigenous Peoples are collective, experiential, time-tested and intergenerational, bridging both what is sometimes termed "tangible" and "intangible" cultural heritage, and is thus distinct in many ways from other knowledge systems.

This section focuses on how Indigenous curricula and educational materials have been developed and incorporated into formal and informal education systems. Examples from the FWG members and LCIPP contributors present a broad array of contexts and modalities.

a. Informal Knowledge Systems

For this literature review and without any prejudice, informal knowledge systems refer to the transmission of knowledge through oral traditional and cultural practices.

Women and elders in Indigenous communities often serve as custodians of knowledge systems. [5] This knowledge is passed down through stories, songs, dances, carvings, paintings and performances.[6] Indigenous knowledge systems are essential to intergenerational environmental stewardship and social resilience.[7] The Convention on Biological Diversity (CBD) emphasizes the vital role of women and elders in intergenerational knowledge transmission within Indigenous communities. The oral traditions of storytelling, and hands-on learning, have been highlighted by the Indigenous knowledge holders.[8]

- *Sámi, Northern Europe*: Sámi women[9] note that their bodies respond to environmental changes, acting as "gauges" for shifting fish populations in warming waters. [10]
- *Swinomish (Pacific Northwest, USA):* Education[i] emphasizes familial and community connections to pass on traditional knowledge and maintain stewardship.[11]

Traditional rituals and cultural practices are important means of informal transmission of knowledge to younger generations.

- *Zulu[ii] fishing communities (South Africa):* Traditional rituals like *ukulondaloza*[iii] transfer knowledge about fishing, medicinal plant use, and sustainable building materials from one generation to the next. [12]
- *Chitonga (Malawi)*: *Nthanu*[iv] *(storytelling)* is core to 'education' in this community, fostering knowledge continuity. [13]
- *Ipili*[v] (*Papua NewGuinea*):[14] Elders hold exclusive knowledge, organizing initiations for youth to learn cultural practices, traditional songs and problem-solving methods.
- *North Samburu, Bangladesh*, Indigenous children learn about rotational farming, and cultural practices through daily activities and games, reinforcing respect for cultural heritage.[15,16] ,
- *Kalaallit* [vi]*or Inuit knowledge*[17] about climate change has been passed down through generations. For example, the word 'snow' has 50 different words connected to it in Innuit language.

[i] Swinomish Education Approach is an educational model that emphasizes community collaboration and intergenerational transmission of Indigenous knowledge in the Swinomish community.

[ii] Traditional knowledge among Zulu fishing communities, including resource management, rituals, and sustainable practices.

[iii] Zulu fishing and resource management traditions transferred through ritualistic and cultural practices.

[iv] Storytelling as an educational tool in the *Chitonga* Indigenous community of Malawi.

[v] Papua New Guinea community practices of initiating youth into cultural knowledge through rituals and gender-specific training.

[vi] Generational knowledge among Inuit peoples that includes environmental indicators and nuanced vocabulary for snow types.

- *Karbi*[vii]*, India*: Community workshops, cultural programmes, and digital resources preserve land management traditions and climate activism. [18]
- *Peruvian Amazon*: The Cultural Assertion Centre[viii] promotes community-driven activities (e.g., cooking skills, traditional seed exchanges, ***minga***[ix] or communal labor) and fosters intercultural exchanges through internships, ensuring intergenerational transmission.

In addition to the incorporation of Indigenous knowledge in informal education systems. This review also examines the incorporation of Indigenous knowledge in formal education systems.

b. Formal Knowledge Systems

Indigenous knowledge is the cumulative body of beliefs, practices, and expertise rooted in Indigenous values and worldviews amassed and refined over generations of interaction with nature. The Intergovernmental Panel on Climate Change highlighted the role of Indigenous knowledge in enhancing community resilience and sustainable resource management (IPCC, 2019). Similarly, UNESCO (2018) highlighted the necessity of integrating Indigenous ways of knowing into formal curricula to foster an inclusive and holistic learning environment. This sub-section examines the incorporation of Indigenous knowledge in formal education systems, including the Master's Programme at Kathmandu University, which is a direct outcome of the LCIPP workplan activity discussed in this review.

Case Stories in Higher Education

i. Kathmandu University's Master's Programme [19]

Kathmandu University's one-year Master's program in Indigenous Education and Development emerged from extensive deliberations on the significance of Indigenous knowledge and local practices rooted in cultural values and nature stewardship. By focusing on customary laws, traditional governance, and sustainable resource management, the

[vii] An Indigenous community in Assam, India, known for youth engagement in climate activism and traditional land management education.

[viii] An initiative in the Peruvian Amazon fostering community learning through traditional cooking, seed exchange, and collective labor practices.

[ix] A community-driven labour system in the Peruvian Amazon used for ecological and cultural activities.

curriculum seeks to restore cultural heritages ruptured by modern education systems and foster holistic solutions to global challenges, including climate change. Key objectives include promoting cultural diversity and inclusivity, researching and advocating for decolonizing knowledge, enhancing critical thinking, and developing intercultural competencies. Through this program, students gain a deeper appreciation for cultural differences and learn to build inclusive, equitable societies while addressing environmental concerns from Indigenous Peoples' and local communities' perspectives.

ii. University of British Columbia's Master of Education in Indigenous Education [20]

The University of British Columbia's MEd in Indigenous Education advances the university's commitments under its 2018–2028 strategic plan (Shaping UBC's Next Century), the Faculty's 2019–2024 strategic plan (Learning Transformed), and the 2020 UBC Indigenous Strategic Plan—each responding to the Truth and Reconciliation Commission's Calls to Action. Beginning July 2022, this 30-credit blended learning program is tailored for educators, administrators, Indigenous community members, and other professionals seeking to deepen their knowledge of K–12 Indigenous frameworks, theories, policies, and curricular approaches. Offered collaboratively by the Departments of Language and Literacy Education, Educational Studies, and Curriculum and Pedagogy—with leadership from the Office of Indigenous Education—the program includes land- and place-based summer institutes and subsequent online coursework. This format accommodates full-time educators, increases access for Indigenous learners, and integrates the revised provincial K–12 curriculum emphasizing First Peoples Principles of Learning.

iii. Indigenous Intercultural University (IIU) [21]

Commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and led by the Fondo para el Desarrollo de los Pueblos Indígenas de América Latina y El Caribe, the Indigenous Intercultural University (IIU) operated from 2005 to 2017 across eleven Latin American countries and Spain. Recognizing that existing education systems often marginalize Indigenous knowledge, the IIU established a virtual network of conventional and Indigenous universities, Indigenous experts, and graduates to offer blended postgraduate programs integrating Indigenous worldviews and gender equality. The curriculum spans Indigenous Law, Intercultural Medicine, Intercultural Bilingual Education, Governance and Public Policy, International Cooperation, Self-Determined Development, Preservation of Indigenous Languages, and Strengthening the Leadership Skills of Indigenous

Women and more. Combining online study with in-person institutes—guided by Indigenous faculty from diverse communities—the IIU deepens dialogue between Western academic approaches and Indigenous epistemologies.

Key outcomes include the graduation of nearly 1,000 participants, over half of them women, drawn from more than 90 Indigenous groups. Most now hold leadership roles in Indigenous organizations, government, or academia. The IIU's approach, which integrates courses into existing universities and supports a robust alumni network, has fostered the institution's long-term sustainability. Recognized by UNESCO and seen as a model for higher education innovation, the IIU demonstrates the transformative potential of inclusive, intercultural programs in advancing Indigenous rights and expertise. The incorporation of Indigenous knowledge systems into formal schooling in Mexico is being carried out through the Multicultural universities like the Universidad Autónoma Intercultural de Sinaloa [22], Universidad Intercultural de Chiapas[23] . Indigenous educators, aligned with the National Alliance of Indigenous Bilingual Professionals (ANPIBAC)[24] , have progressed the implementation of bilingual and bicultural education systems specifically designed to address the cultural and linguistic needs of Indigenous communities.

iv. Master of Indigenous studies program at Victoria University of Wellington (Te Herenga Waka)[25]

Whare Wānanga o Awanuiārangi[26] in New Zealand works to equip Indigenous communities with dignity and confidence, developing cultural heritage and broadening the knowledge base of the descendants of Awanuiārangi and all Māori. Alongside, the Master of Indigenous studies program at Victoria University of Wellington (Te Herenga Waka[x]) covers the Indigenous colonial and post-colonial experiences, cultural rights, and self-determination of the Māori and Pacific cultures.[27] To nurture appreciation for cultural diversity, these programmes seek to create educational settings that honour the Indigenous culture and traditions in a more equitable way.

v. Indigenous Knowledge Systems Center at the Northwest University of South Africa [28]

Northwest University (NWU) is a pioneer in African Indigenous Knowledge Systems (IKS) research and education in South Africa and across the continent. Housed in the Faculty of Natural and Agricultural Sciences at NWU's Mahikeng campus, the IKS Centre offers a four-

[x] A program at Victoria University of Wellington covering Indigenous colonial and post-colonial experiences, cultural rights, and self-determination.

year Bachelor of Indigenous Knowledge Systems (BIKS) program, approved by relevant academic authorities and focused on interdisciplinary teaching, research, and community engagement. Recognized in various local languages—such as "*Kitso ya tlhago*" (Setswana) and "*Ulwazi le sintu*" (isiZulu)—IKS is the body of skills, philosophies, and decision-making practices that guide daily life, including climate resilience and natural resource management. NWU collaborates with several South African universities under the DSI-NRF Centre in Indigenous Knowledge Systems (CIKS), reinforcing national policies on decolonization, cultural diversity, and sustainable development. This holistic approach affirms IKS as a vital component of higher education, linking academic research to traditional knowledge holders and promoting inclusive, transformative learning.

vi. Indigenizing Conservation Science for a Sustainable Amazon, Princeton University [29]

Grounded in recommendations by the Scientific Panel for the Amazon, this collaborative project brings together Indigenous and non-Indigenous scholars, including Professors João Biehl and Agustín Fuentes (Princeton University) and Marina Hirota (Federal University of Santa Catarina), to align Indigenous and Western scientific perspectives on sustainability, conservation, restoration, and planetary health. Supported by Princeton's Office of the Dean of Research and the High Meadows Environmental Institute, and in partnership with the Serrapilheira Institute, the team investigates how Indigenous knowledge—guided by millennia of sustainable living in tropical ecosystems—can inform alternative scientific paradigms and conservation policies. Through cross-pollination of socioecological methods and principles, this co-creative endeavor aspires to advance holistic, inclusive approaches that unite scientific findings with Indigenous theories and practices for a more sustainable Amazon.

vii. Intercultural and Multicultural Universities in Mexico

a. Universidad Autónoma Intercultural de Sinaloa [30]

This university integrates local and Indigenous epistemologies—predominantly from the Yaqui, Mayo, and other regional communities—into its environmental science and social work programs. Students learn participatory research methods that value oral histories, communal decision-making, and kinship-based resource management systems.

b. Universidad Intercultural de Chiapas [31]

Chiapas is home to diverse Indigenous Peoples (e.g., Tzotzil, Tzeltal, Chol) that experience acute climate vulnerabilities such as deforestation and soil erosion. The university's curriculum includes field immersions in local communities, equipping students to conduct climate risk assessments from a culturally grounded perspective. Collaborative projects

address sustainable agriculture and forest regeneration informed by centuries-old Indigenous land-use practices.

These Mexican intercultural universities have emerged under a broader national policy to expand higher education opportunities for Indigenous youth and create academic programs that directly reflect local cultural contexts, environmental realities, and linguistic diversity (Schmelkes, 2009).

viii. Indigenous Intercultural Education at Universidade Federal de Santa Catarina in Brazil[32]

Established in 2010, this program prepares Guarani, Kaingang, and Laklãnõ-Xokleng students to become secondary school teachers in Indigenous schools and to conduct community-centered research from an intercultural, interdisciplinary perspective. Focused on the southern Atlantic Forest biome, it addresses land and environmental issues, offering four teaching pathways: early childhood, languages (emphasizing Indigenous languages), humanities (emphasizing Indigenous rights), and ecological knowledge (emphasizing environmental management). Implementing a Pedagogy of Alternation, the program alternates between University Time—on the Florianópolis campus or in Indigenous schools—and Community Time, during which students engage in fieldwork and activities in their own territories under the guidance of Indigenous knowledge holders and faculty members.

ix. Deyohahá:ge: Indigenous Knowledge Centre at the Six Nations Polytechnic[33]

Deyohahá:ge (Two Roads) merges ancestral Indigenous knowledge with modern academic perspectives to advance the well-being of all peoples. Its primary goals are to preserve and nurture Indigenous wisdom, while fostering community-based research that upholds Indigenous protocols and ensures local communities benefit from research findings. By offering a balanced platform for Indigenous research and knowledge sharing, Deyohahá:ge helps address knowledge gaps about Indigenous histories, the impacts of colonization, and outstanding obligations such as access to lands, resources, and cultural revitalization. Through its Hodinohso:ni collections archives, the Centre strives to be a key resource for Indigenous Knowledge, informing and enhancing diverse programs and services to sustain and protect Indigenous heritage for future generations.

x. Centre for Indigenous Knowledge[34] *at Doctor Harisingh Gour Vishwavidyalaya*

Center for Indigenous Knowledge at *Doctor Harisingh Gour Vishwavidyalaya* (University) is India's first Indigenous knowledge study centre that aims to conserve Indigenous knowledge about sustainability and encourages academics, policy makers, scientists and students to gain enhanced respect for local cultures, its wisdom and its environmental ethics.

In addition to the case stories highlighted above, Curricula in various countries, including Kenya, Uganda, Nigeria, and Tanzania, have incorporated the pastoral knowledge of Indigenous communities, utilizing teaching aids such as visual materials and field-based activities from primary through secondary levels. Several ethnic districts in Russia have also established national ethnic schools where courses are taught in Indigenous languages. Meanwhile, in the Arctic region, the Inuit/Kalaallit school curriculum has introduced materials covering traditional cultural practices and Inuit history; for example, teaching drum playing not only enhances students' learning but also strengthens their connection to ancestral traditions.

Incorporating Indigenous knowledge into school curricula is essential for fostering cultural sensitivity, passing on traditional practices, and empowering Indigenous youth. The Nunavut model of education[xi] exemplifies this approach, as it is both philosophically and foundationally grounded in Inuit *Qaujimajatuqangit*[xii], reflecting the values and practices that have sustained Inuit society for generations.

IV. **Ethical and Equitable Use of Indigenous Curricula and Materials**

Indigenous knowledge is often collectively generated and safeguarded, reflecting diverse values, worldviews, epistemologies, ontologies, and axiologies. Some of this knowledge may be confidential or extend beyond conventional physical and spiritual realms. Furthermore, Indigenous knowledge may involve intellectual property in various forms, such as medicinal and curative information about flora, cultural expressions (dance, art, music), ecological knowledge for water harvesting and resource management, and linguistic traditions.

The LCIPP was established to promote the exchange of experiences and best practices with a view to applying, strengthening, and protecting and preserving traditional knowledge, knowledge of Indigenous Peoples and local knowledge systems, taking into account the free, prior and informed consent of the holders of such knowledge.[35] This section highlights a selection of existing guidance materials and protocols for the ethical and equitable application of Indigenous knowledge and local knowledge systems.

a. Rights Safeguards and Protocols, guidance prepared by the FWG[36]

[xi] An educational framework in Nunavut, Canada, that incorporates Inuit Qaujimajatuqangit into curricula to reflect Indigenous philosophies.

[xii] Inuit traditional knowledge and principles that guide decision-making and education in Nunavut, Canada.

In its role to further operationalize the LCIPP, and facilitate the implementation of the Platform's functions, the FWG developed the following guidance for the LCIPP portal:

1. The Local Communities and Indigenous Peoples Platform (LCIPP), including through this web portal, "promote[s] the exchange of experience and best practices with a view to applying, strengthening, protecting and preserving traditional knowledge, knowledge of indigenous peoples and local knowledge systems, as well as technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change, taking into account the free, prior and informed consent of the holders of such knowledge, innovations and practices" (decision 2/CP.23).
2. The LCIPP web portal is designed to make the work of the LCIPP widely accessible. It will provide parties, indigenous peoples and local communities with the opportunity to share and exchange relevant information.
3. It will share projects, programs, statements, event outcomes and good practices to promote ethical engagement with the knowledge of indigenous peoples and local communities and avoid misuse of that knowledge, in accordance with the functions of the LCIPP. It is not intended to act as a repository of the knowledge of indigenous peoples and local communities or post information that is protected or intended to remain internal.
4. Submissions from indigenous peoples or local community representatives will be posted only at the direct request of the indigenous peoples and local communities concerned.
5. The FWG requests that third parties provide confirmation of the free, prior and informed consent of the indigenous peoples concerned, or the expressed agreement of the relevant local communities.
6. The preamble of the Paris Agreement acknowledges that Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on, inter alia, "human rights … the rights of indigenous peoples, local communities". In this context, reference is made to paragraph 135 of decision 1/CP.21, which established the LCIPP; decision 2/CP.23, which decided the overall purposes and functions of the LCIPP; and decision 2/CP.24, which established the Facilitative Working Group of the LCIPP (FWG).
7. This web portal was developed in consultation with the FWG and its nominated representatives of indigenous peoples, taking into account the United Nations Declaration on the Rights of Indigenous Peoples, decision 1/CP.21, the Paris Agreement, and the other decisions listed above.

b. Circumpolar Inuit Protocols for Equitable and Ethical Engagement[37]

The Circumpolar Inuit Protocols for Equitable and Ethical Engagement were formulated through two main processes and comprise eight core protocols. The first was an Inuit Circumpolar Council (ICC) synthesis of Inuit-produced materials that address existing rules, laws, values, guidelines, and protocols for engaging Inuit communities and Indigenous knowledge. The second involved a series of workshops with Inuit delegates, gathering Inuit perspectives, priorities, and guidance for future engagement processes.

The eight protocols are:

1. 'Nothing About Us Without Us' – Always Engage with Inuit
2. Recognize Indigenous Knowledge in its Own Right
3. Practice Good Governance
4. Communication with Intent
5. Exercising Accountability - Building Trust
6. Building Meaningful Partnerships
7. Information, Data Sharing, Ownership and Permissions
8. Equitably Fund Inuit Representation and Knowledge

c. Akwé: Kon Guidelines[38]

The *Akwé*: Kon Voluntary Guidelines, developed under the Convention on Biological Diversity's (CBD) programme of work on Article 8(j) and related provisions, provide a framework for conducting cultural, environmental, and social impact assessments for developments proposed on, or likely to affect, sacred sites and lands and waters traditionally occupied or used by Indigenous and local communities. The Akwé: Kon Voluntary Guidelines, developed under the Convention on Biological Diversity's programme of work on Article 8(j) and related provisions, guide "Conduct of Cultural, Environmental and Social Impact Assessments Regarding Developments Proposed to Take Place on, or which are Likely to Impact on, Sacred Sites and on Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities."

d. The Tkarihwaié: ri Code of Ethical Conduct[xiii] [39]

[xiii] A code under the Convention on Biological Diversity guiding ethical use and sharing of Indigenous traditional knowledge.

The *Tkarihwaié: ri* Code of Ethical Conduct offers guidance to Parties and other relevant entities when engaging with Indigenous Peoples and local communities. Upon adopting the Code, CBD Parties acknowledged that "respect for traditional knowledge requires that it is valued equally with and complementary to scientific knowledge, and that this is fundamental in order to promote full respect for the cultural and intellectual heritage of Indigenous and local communities relevant to the conservation and sustainable use of biological diversity."

General ethical principles of the Code include:

- Respect for existing settlements
- Intellectual Property
- Non-discrimination
- Transparency/full disclosure
- Prior informed consent and/or approval and involvement
- Inter-cultural respect
- Safeguarding collective or individual ownership
- Fair and equitable sharing of benefits
- Protection
- Precautionary approach

e. *The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization* [40]

The Bonn Guidelines help Parties and other stakeholders devise access and benefit-sharing strategies. They detail the steps involved in obtaining access to genetic resources and sharing benefits, including mechanisms for effective participation by Indigenous Peoples and local communities.

V. Climate Action through Indigenous Curricula

This section examines how incorporating Indigenous knowledge and local practices into educational curricula fosters greater understanding of, and effective responses to, climate change. By providing locally informed and spatiotemporally granular information, Indigenous knowledge often complements scientific data, enriching climate mitigation and adaptation efforts, while building resilience for all. [41]

Kenya's National Climate Change Learning Strategy exemplifies this approach by incorporating climate education into its national framework and establishing a gender-disaggregated monitoring and reporting system.[42] In Marigat, Baringo, *Ilchamus*

Pastoralists[xiv] community uses traditional knowledge and Indigenous practices to guard against drought and extreme weather events,[43] a model that has woven into local education programmes and encourages community-led climate action.

Similarly, Malawi's Action for Climate Empowerment (ACE) incorporates formal and informal learning strategies that regard Indigenous knowledge as an essential component in climate action. The curriculum includes traditional sustainable resource management and other community-based adaptation practices.[44]

In the Chittagong hill tracks, organisations like the Malay Foundation, Eastern Himalayan network on climate change, and the Institute for Trainings are working on Indigenous curricula development and researching how traditional knowledge contributes to both adaptation and mitigation in the Himalayan region.

Brazil's Quilombola community illustrates the benefits of embedding Indigenous knowledge in national climate strategies, ensuring ecosystem conservation while maintaining cultural integrity. [45]

In the Tusheti region of Georgia, as well as the Garhwal and Kumaon regions of India, traditional pastoralist communities have practiced transhumance[xv] for centuries—an approach that supports biodiversity conservation and soil fertility. Local educational initiatives now incorporate these practices into climate adaptation programs.[46,47],

In the United States, the Midwest CASC Tribal Research Experience for Undergraduates (REU) program, hosted by the College of Menominee Nation, trains Tribal college students to become climate change science professionals. It offers hands-on research and internship opportunities in climate-related fields, building crucial capacity in Tribal communities.[48]

Finally, in Kazakhstan, collaboration between Indigenous communities and local universities integrates traditional nomadic herding practices and knowledge into national strategies for climate adaptation and environmental science education. Through such partnerships, invaluable Indigenous knowledge is effectively transmitted to the scientific community, further enhancing collective efforts to combat climate change.[49]

[xiv] An Indigenous community in Kenya known for their ecological knowledge and practices to combat drought and climate change.

[xv] Nomadic pastoralist practices in regions like Garhwal and Kumaon in India that contribute to biodiversity and soil fertility preservation.

VI. Discussion

This section seeks to document and share the discussions and recommendations from the *LCIPP roundtable on Indigenous Curricula and Educational Materials* that took place at COP 29. The roundtable brought together both Indigenous and non-Indigenous representatives to exchange experiences and views on ways for meaningful incorporation of Indigenous knowledge into climate action and formal education systems.

Examples of specific curricula were reviewed, such as OHCHR-led training programs for Indigenous Peoples' representatives, which offer multilingual online instruction in five languages. The discussion further underscored the importance of accelerating cross-continental and cross-regional exchanges—such as Himalayan-Mekong linkages—to improve the documentation of Indigenous knowledge and practices, thereby supporting the development of Indigenous educational curricula.

To ensure ethical and respectful engagement with Indigenous knowledge, participants offered several recommendations:

- *Respect for Use*: Indigenous communities should determine how their knowledge is employed.
- *Teaching Materials*: Educational resources must remain accurate, avoiding stereotypes or oversimplifications.
- *Use of Indigenous Language*: Indigenous languages should be directly incorporated into educational systems to avoid the loss of deep and complex cultural and ecological knowledge in translation.
- *Decolonization*: Educational materials need to shift away from colonial frameworks, and revitalize Indigenous storytelling, oral traditions, and pedagogies.
- *Artificial Intelligence*: Participants of the LCIPP roundtable also recommended including Indigenous Peoples and Local Communities in discussions on artificial intelligence and its potential implications for knowledge systems and their preservation.

Knowledge holders also noted gaps in awareness among local resource persons, who often lack familiarity with international initiatives. Despite the availability of relevant documentation and trained teachers, Indigenous curricula are rarely incorporated into formal education, remaining optional rather than standard. Consequently, participants stressed the need for awareness-building efforts to mainstream Indigenous knowledge in educational systems.

VII. Moving Forward

a. Trends observed in the development and use of Indigenous curricula and materials related to climate change.

The case stories and examples highlighted in this review indicate that, although there are efforts to incorporate Indigenous knowledge into formal education systems, such initiatives remain limited. Nevertheless, the existing Indigenous knowledge centers and programmes can serve as springboards for enhanced incorporation of Indigenous knowledge across both formal and informal educational contexts. In doing so, existing ethical guidelines and protocols emphasize that Indigenous knowledge embodies values, worldviews, and understandings requiring careful stewardship. This includes obtaining knowledge holders' free, prior, and informed consent before incorporating their expertise. Furthermore, the examples examined here underscore that Indigenous knowledge spans biological, cultural, and spiritual domains; as such, its documentation and transmission necessitate a holistic approach that includes preserving and revitalizing Indigenous languages and cultural practices. The following sections outline trends emerging from the literature.

1. Incorporation of Indigenous knowledge into formal education systems

There are efforts to incorporate Indigenous knowledge into formal education, ranging from primary school curricula to higher education programs. These initiatives often involve collaboration between Indigenous communities and educational institutions to ensure cultural accuracy and respect for knowledge holders. While these efforts remain relatively small in scope, they highlight a growing recognition of the value and relevance of Indigenous perspectives for addressing climate change and fostering environmental stewardship.

2. Revival and revitalization of Indigenous languages and cultural knowledge

Examples such as the Swinomish approach illustrate the importance of “re-learning” mechanisms to recover traditional conservation and adaptation practices. In parallel, some universities now incorporate Indigenous languages into their curricula to strengthen cultural identity and encourage the transmission of traditional ecological knowledge. These endeavours help sustain Indigenous languages—often the vessels for conveying cultural and ecological wisdom—and reinforce the cultural underpinnings necessary to address climate challenges.

3. Adhering to the Principles of Free, Prior, and Informed Consent (FPIC)

International bodies, including the United Nations, have encouraged national governments to align domestic laws and educational policies with international standards that uphold Indigenous peoples’ rights. Central to these standards is FPIC, which ensures that Indigenous communities retain agency over their knowledge and its application. Educational projects or research

endeavours that seek to use Indigenous knowledge should therefore collaborate meaningfully with community members, respecting their autonomy and intellectual property rights.[50,51] ,

4. Digital Platforms and Open Access to Indigenous Knowledge

The growth of online learning platforms, including Massive Open Online Courses (MOOCs) such as Indigenous Canada offered by the Faculty of Native Studies, has expanded the reach and impact of Indigenous knowledge.[52] By offering open-access materials, these digital platforms facilitate broader participation and increase awareness of Indigenous perspectives among both Indigenous and non-Indigenous learners. They also create new opportunities for networking, collaboration, and sharing of best practices globally.

5. Inter-generational and inter-cultural linkages

Efforts to transmit Indigenous knowledge often involve bridging modern education with ancestral wisdom, facilitating intergenerational learning. Mutual learning mechanisms—where students, elders, and educators collaborate—are emerging as effective approaches to foster intercultural understanding. By embedding Indigenous perspectives within mainstream curricula, educational systems can promote more holistic and inclusive strategies for climate adaptation and environmental management.

6. Gender Inclusion and the Role of Indigenous Women

Indigenous women have long been key stewards of cultural and ecological knowledge. Recognizing their critical roles, existing programmes and initiatives seek to ensure that their voices are integral to curriculum design and decision-making processes. By centering Indigenous women's experiences and expertise within formal and informal education, these projects acknowledge women's unique perspectives on conservation, sustainability, and resilience, thereby strengthening the collective capacity to address climate challenges.

7. Applying the insights and case stories from this literature review to the implementation of the Baku Workplan

The literature review highlights several insights and examples that can enrich the work of the LCIPP in promoting knowledge exchange, building capacity for engagement, and incorporating diverse values, worldviews, and knowledge systems into the design and implementation of climate policies and actions.

First, while there is widespread recognition of the critical role of Indigenous knowledge—rooted in cultural values and worldviews—there remains an opportunity to foster deeper understanding and appreciation of these values and worldviews. This review points to numerous case studies, including master's programmes at the University of British Columbia and Kathmandu University,

which can serve as starting points for more profound engagement with knowledge holders and practitioners.

Second, the LCIPP's work, as detailed in its third function, facilitates the incorporation of diverse knowledge systems, practices, and innovations into climate policies and actions in ways that respect and promote the rights and interests of local communities and Indigenous Peoples (in line with decision 2/CP.23). The Baku Workplan of the LCIPP also includes a mandated deliverable to "develop a draft ethics protocol." The ethical frameworks highlighted in this review—such as the Circumpolar Inuit Protocols and the *Tkarihwaié: ri* Code of Ethical Conduct—provide valuable guidelines for the ethical and equitable application of Indigenous knowledge.

Finally, the LCIPP was established to enhance the engagement of Indigenous Peoples and local communities within the UNFCCC process. Over the past decade, there has been increasing participation by Indigenous experts and representatives of local communities in relevant UNFCCC work, including membership in various thematic and advisory bodies and contributions to technical forums and knowledge products. Indigenous Knowledge Centres and programmes featured in this review further strengthen the LCIPP community, working collaboratively to address climate change holistically and restore collective stewardship of nature.

Annex I

Rights safeguards and protocols

The FWG has provided the following guidance on the dedicated web portal:

Important information regarding rights safeguards and protocols for the LCIPP portal

1. The Local Communities and Indigenous Peoples Platform (LCIPP), including through this web portal, "promote[s] the exchange of experience and best practices with a view to applying, strengthening, protecting and preserving traditional knowledge, knowledge of indigenous peoples and local knowledge systems, as well as technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change, taking into account the free, prior and informed consent of the holders of such knowledge, innovations and practices" (decision 2/CP.23).
2. The LCIPP web portal is designed to make the work of the LCIPP widely accessible. It will provide parties, indigenous peoples and local communities with the opportunity to share and exchange relevant information.
3. It will share projects, programs, statements, event outcomes and good practices to promote ethical engagement with the knowledge of indigenous peoples and local communities and avoid misuse of that knowledge, in accordance with the functions of the LCIPP. It is not intended to act as a repository of the knowledge of indigenous peoples and local communities or post information that is protected or intended to remain internal.
4. Submissions from indigenous peoples or local community representatives will be posted only at the direct request of the indigenous peoples and local communities concerned.
5. The FWG requests that third parties provide confirmation of the free, prior and informed consent of the indigenous peoples concerned, or the expressed agreement of the relevant local communities.
6. The preamble of the Paris Agreement acknowledges that Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on, inter alia, "human rights … the rights of indigenous peoples, local communities". In this context, reference is made to paragraph 135 of decision 1/CP.21, which established the LCIPP; decision 2/CP.23, which decided the overall purposes and functions of the LCIPP; and decision 2/CP.24, which established the Facilitative Working Group of the LCIPP (FWG).
7. This web portal was developed in consultation with the FWG and its nominated representatives of indigenous peoples, taking into account the United Nations Declaration on the Rights of Indigenous Peoples, decision 1/CP.21, the Paris Agreement, and the other decisions listed above.

Annex II. References

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