

# **Weaving Wisdom Across Borders: *Indigenous Knowledge Systems for Sustainable and Inclusive Development in the Asia-Pacific***

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<b>Glossary Term</b>	<b>Meaning</b>
Adivasi	A member or descendant of any of the Indigenous peoples of South Asia.
Apatani	The Apatani (or Tani) are an indigenous tribal community residing in the Ziro Valley of Arunachal Pradesh, India.
Mātauranga	Mātauranga, in Maori, refers to knowledge and understanding- to a way of seeing the world through a lens of kinship, of recognizing the reciprocal responsibilities that arise from human-environment relationships.
Rākau rongoā	<i>Rākau rongoā</i> refers to traditional Māori herbal medicine, utilizing native plants, trees, and shrubs to treat ailments and restore physical and spiritual well-being.
Talanoa	Talanoa refers to an inclusive, transparent, and participatory process of dialogue, storytelling, and relationship building
Wawasan Kemakmuran Bersama (WKB)	The WKB or Shared Prosperity Vision 2030 (SPV 2030), is a Malaysian government blueprint aimed at restructuring the nation's economy to achieve sustainable, fair, and equitable growth.
Kawakawa	A New Zealand shrub of the pepper family with aromatic eaves, cultivated as an ornamental.
Kiribati	An independent island republic in the central Pacific Ocean, comprised of 32 atolls and one coral island
Orang Asli	Indigenous peoples of Peninsular Malaysia (e.g., Temuan tribe); maintain knowledge tied to lands, with elders (Batin) mediating via traditional medicine and harmony principles.
Penuak:	Sarawak community in Malaysia; their IKS centers on Apong ( <i>Nypa fruticans</i> ) processing with mangrove stewardship and hybrid innovations.
Khasi	Meghalaya community cultivating living root bridges from <i>Ficus elastica</i> for flood-resistant infrastructure.
Gond	Madhya Pradesh Adivasis managing mahua-dominated agroforestry for carbon stocks and processing.

Toda	Pastoralists using ghee-based pastes aligned with migration cycles for health.
Batin	Orang Asli elder mediators skilled in traditional medicine and conflict resolution.
Apong	Penuak fermented drink from <i>Nypa fruticans</i> ; embodies selective harvesting and site rotation for mangrove health.
Whakapapa	Māori genealogical classifications linking plants to deities and seasons in <i>rākau rongoā</i> .
Ni-Vanuatu	Vanuatu communities predicting cyclones via ancestral cloud formations.

## **1. Executive Summary**

Across the Asia-Pacific region, Indigenous Knowledge Systems (IKS) have sustained societies for millennia through sophisticated understandings of ecology, health, governance, and social cohesion. From climate-resilient agricultural practices in South Asia to customary marine management in the Pacific Islands, Indigenous knowledge continues to offer context-specific solutions to contemporary development challenges. Yet, despite growing global recognition, IKS remain marginal within dominant science, technology, and innovation (STI) frameworks and development policies.

This policy brief argues that achieving sustainable and inclusive development in the Asia-Pacific requires the systematic integration of IKS into policy design, research ecosystems, and innovation pathways, which requires explicit recognition of their legitimacy and distinctiveness. Current development models—largely shaped by Western epistemologies—often overlook Indigenous ways of knowing, resulting in ineffective, inequitable, and sometimes harmful interventions. Persistent gaps between recognition and implementation reflect structural barriers in research governance, funding architecture, and ethical standards.

Drawing on regional case studies from South Asia, Malaysia, and the Pacific Islands, this brief demonstrates how Indigenous knowledge contributes to biodiversity conservation, climate adaptation, food security, and social resilience. It identifies key structural barriers that limit the meaningful inclusion of IKS and proposes actionable recommendations across four areas: systemic recognition in STI policies, reform of funding mechanisms, ethical governance frameworks, and capacity building for both researchers and Indigenous communities.

## **2. Context and Problem Statement**

The accelerating crises of climate change, biodiversity loss, and cultural erosion have catalyzed urgent global discourse on sustainable futures, with the UN's 2030 Agenda and IPCC's Sixth Assessment explicitly calling for diverse knowledge integration to address policies (UN, 2015; IPCC, 2022). At the heart lies a profound paradox: while forums like COP28 and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) celebrate IKS, these epistemologies remain systematically marginalized in policy architectures and scientific practice in most research ecosystems.

While IKS have been practiced by many indigenous communities and several scholars have argued for their scientific validity, IKS as a knowledge system has not even been recognized till recently. The current climate crisis, with impacts on food security and health, as well as pollution of air, land and water, have prompted renewed interest in IKS around the world.

## **2.1 Defining Indigenous Knowledge Systems**

IKS refer to the cumulative, place-based, and intergenerational knowledge developed by Indigenous peoples through long-term interaction with their natural and social environments. IKS constitute ancestral, traditional, community-held, land-based, and place-based epistemologies that have evolved through millennia of intimate, adaptive co-evolution with specific ecosystems and cultural landscapes (Battiste, 2000). These systems represent dynamic, living knowledge architectures continuously refined through environmental feedback loops, technological hybridization, and socio-political adaptation while remaining anchored in foundational ethical principles of reciprocity. While we use the terms interchangeably, the distinction between Indigenous knowledge and IKS is important, as the latter highlights the need to understand the entire system in which knowledge is produced and used.

IKS encompasses ecological management, agriculture, medicine, disaster risk reduction, governance, spirituality, and social organization. Unlike formal scientific knowledge systems, IKS are often transmitted orally, embedded in cultural practices, and governed by collective ownership rather than individual authorship. Unlike Western science's compartmentalized methodologies that bifurcate subject and object or nature and culture, IKS integrate ecological stewardship, cosmological principles, social organization, and economic praxis into coherent worldviews. Balance and relationality serve as axiomatic rather than aspirational principles (UNESCO, 2023).

According to the Tongan scholar Timote Vaoleti, Transmission occurs primarily through oral traditions, embodied apprenticeship, ceremonial practice, songs, myths, and kinship networks rather than decontextualized written texts, embedding profound understandings of ecology, cosmology, governance, pharmacology, and hydrology within local languages and spiritual ontologies (Vaoleti, 2011).

In the Asia-Pacific, Indigenous knowledge is extraordinarily diverse, reflecting the region's vast ecological and cultural landscapes. Despite this diversity, IKS share common characteristics: holistic worldviews, relational ethics between humans and nature, and adaptive practices rooted in lived experience.

## **2.2 Limitations of Current Knowledge Regimes**

Contemporary development and Science Technology & Innovation (STI) frameworks largely privilege codified, laboratory-based, and market-oriented knowledge. While these approaches have generated technological advances, they often fail to address local realities, especially in environmentally fragile and culturally diverse contexts. The dominance of Western epistemologies has led to the marginalization of Indigenous knowledge, framing it as “informal,” “traditional,” or anecdotal rather than systematic and innovative. Boaventura de Sousa Santos theorizes that Western scientific hegemony produces “abyssal thinking,” establishing an epistemological chasm where modern science claims universal authority over truth-making, systematically invisibilizing all knowledges on the “other side of the line” (Santos, 2007; Hall & Tandon, 2017). This manifests as cognitive imperialism: Indigenous, peasant, and subaltern epistemologies become mere raw material—extracted, decontextualized, and commodified—without recognition of their relational ontologies or sovereign governance, perpetuating coloniality in contemporary sustainability discourses.

In ‘modern’ science, IKS is largely ignored, as knowledge is supposed to be produced only in academia, by academically certified knowledge workers through a methodology that starts from concepts and theories in search of data. Training of young researchers blinds them to any other form of knowledge, its production and use. Reliant on written words (in books and journals, and their digital peers), orality is equated with informality and therefore construed as unsystematic. Pushing for external validity, modern science tends to recognise generalisable ‘truths’. The local, context-specific nature of IKS is thus labelled as ‘traditional’, and hence, by implication, irrelevant in contemporary world.

This epistemic hierarchy limits policy effectiveness. Climate adaptation strategies, biodiversity conservation programs, and public health interventions that exclude Indigenous knowledge frequently encounter resistance, sustainability challenges, or unintended ecological damage.

### **2.3 Global Recognition of Indigenous Knowledge Systems**

At the global level, Indigenous knowledge has gained increasing recognition. International frameworks such as the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), the Convention on Biological Diversity (CBD), and the Intergovernmental Panel on Climate Change (IPCC) acknowledge the value of Indigenous knowledge in sustainable development and climate action. The Sustainable Development Goals (SDGs) also implicitly recognize Indigenous contributions, particularly in goals related to poverty reduction, climate action, and life on land and below water. The global recognition of IKS as vital to sustainable development has accelerated through multilateral frameworks that challenge epistemic monocultures.

UNESCO's 2021 Recommendation on Open Science marks a pivotal shift, positioning IKS as co-equal components of the global scientific ecosystem rather than peripheral contributions. Its four pillars are:

- Open access to data
- Open access to scientific infrastructure
- Open public engagement with diverse societal actors
- Open dialogue with other knowledge systems (including IKS)

The above framing of Open Science creates possibilities of academic and indigenous knowledge systems to interact and engage with each other in research practice (UNESCO, 2021).

This aligns with knowledge democracy frameworks that valorize epistemological pluralism, where diverse ways of knowing— from Adivasi agroecology to Māori mātauranga—hold equivalent legitimacy to Western positivism (Hall & Tandon, 2017). The Recommendation's emphasis on communities as co-creators operationalizes this through concrete mechanisms: transdisciplinary research consortia, citizen science protocols co-designed with Indigenous protocols, and open science infrastructures governed by Free, Prior, and Informed Consent (FPIC).

However, recognition has not consistently translated into institutionalized practices at national and regional levels. National STI policies and research funding mechanisms have not yet included IKS as relevant on its own merit. Where IKS is mentioned, it tends to be positioned as supplementary to, or somewhat 'add-on' in the narrative. There may also be a fear of IKS as being an 'enemy' of modern science approaches; this however has not been the position of indigenous scholars and communities (DECODE, 2025) that argue for a 'weaving' of different knowledge systems.

#### **2.4 Persistent Gaps in Policy and Practice**

Despite rhetorical commitments, IKS remain underrepresented in policy formulation, research agendas, and innovation systems across the Asia-Pacific. Indigenous communities are often consulted symbolically rather than engaged as equal partners. Knowledge extraction without benefit-sharing, lack of legal protection for collective intellectual property, and insufficient funding for Indigenous-led research continue to undermine trust and equity.

“Recognizing the diversity of knowledges in the world and creating new ecologies of knowledge is important for redressing past injustices and as a basis for a revitalized knowledge commons that can contribute to realizing more just and sustainable futures.” (Tikly, 2024). The gaps persist because most STI frameworks and knowledge systems are monocultural and designed to promote a particular form of science and knowledge, despite growing recognition of diversities of knowledge cultures.

Diverse knowledge systems, including IKS, develop and function through a system that produces a culture of knowledge work that is distinctive. “Bridging such diverse knowledge cultures” requires addressing issues of power and hegemony of knowledge (Lepore, et al, 2023) and requires reorientation of institutions that support STI policies and related resourcing decisions, within a governance framework which is largely in control of ‘modern’ science establishments at present.

This paper identifies the kinds of actions that will facilitate bridging the gap between intention and practice in the future.

### **3. Evidence and Analysis: Regional Case Studies**

In this section, evidence of recognition and practice of IKS in several Asian/Pacific countries is gathered to demonstrate how it is being presently practiced. These examples are providing emerging insights in furthering integration and inclusion of IKS in national and regional STI systems and policies.

#### **3.1 India**

In India, Indigenous knowledge systems underpin sustainable agriculture and natural resource management, with traditional practices like mixed cropping, seed saving, and rainwater harvesting building climate resilience over centuries. Adivasi children in Chhattisgarh's Bastar district document traditional ecological knowledge through activity-based learning worksheets designed by Azim Premji University, mapping village biodiversity, medicinal plants, sacred groves, and intergenerational bird lore through community-led field activities and elder interviews (Azim Premji University, 2024). Himalayan Indigenous groups employ agroforestry and terracing to minimize soil erosion while boosting biodiversity, integrating nitrogen-fixing alder trees with millet rotations (ICIMOD, 2004). Adivasi communities in Jharkhand's Santhal Pargana practice podu shifting cultivation synchronized with monsoon onset indicators like bamboo flowering cycles, maintaining soil fertility through fallow periods that double as wildlife corridors while sacred groves serve as seed banks and water recharge zones.

In Arunachal Pradesh, Apatani wet-rice systems integrate fish populations for natural pest control, yielding superior drought resilience (ICIMOD, 2004). Khasi communities in Meghalaya cultivate living root bridges from *Ficus elastica* aerial roots, training them across streams over 20-25 years to create flood-resistant infrastructure supporting remote village economies (UNDP India, 2024). Gond Adivasis in Madhya Pradesh manage mahua-dominated agroforestry systems, utilizing fruit residues for traditional processing while maintaining high forest carbon stocks through leaf litter management (FSI, 2019). Indigenous health practices blend herbal

pharmacopeia with ritual ecology, addressing imbalances through plants whose potency elders gauge by lunar phases and soil conditions. Tribal healers across central India prescribe multi-plant forest decoctions for seasonal ailments, achieving high efficacy through traditional protocols (Pereira, 2006). Toda pastoralists apply ghee-based medicinal pastes synchronized with highland migration cycles to maintain respiratory health during seasonal movements.

However, high-input agriculture policies continue to marginalize these sustainable systems despite their proven climate resilience (Ministry of Education, Government of India, 2020). Commercialization and biopiracy have exploited these systems without benefit-sharing, while high-input agriculture policies marginalize them despite superior sustainability.

### **3.2 Malaysia**

In Malaysia, IKS are exemplified through community-based practices that integrate ecological stewardship, cultural preservation, and adaptive innovation. Two case studies demonstrate how IKS contribute to sustainability amid challenges like modernization, land rights, and environmental pressures, while aligning with frameworks like UNESCO's Open Science Recommendation for knowledge co-construction (UNESCO, 2021).

The Orang Asli, indigenous peoples of Peninsular Malaysia, including the Temuan tribe in Kampung Guntur, Negeri Sembilan, maintain a knowledge culture deeply connected to customary lands, oral traditions, and spiritual practices. Through the Mizan K4C Hub's community-based participatory research (CBPR), dialogues with elders (Batin), women, and youth revealed leadership focused on harmony, mediation for conflict resolution, and matrilineal customs emphasizing community cohesion. Elders act as mediators with skills in traditional medicine, while youth aspire to education and infrastructure to preserve identity amid resettlement impacts, high school dropout rates (only 30% complete secondary school), health disparities (e.g., infectious and non-communicable diseases), deforestation, and land rights erosion. Aspirations centre on shared prosperity, cultural preservation, and unity with neighbouring Malay communities, supporting policies like Wawasan Kemakmuran Bersama 2030. This approach bridges indigenous epistemologies with academic knowledge for epistemic equity (Mahazan et al., 2024).

In Samarahan's lowlands, Sarawak, the Penuak community's IKS revolves around the Apong (*Nypa fruticans*) industry, embodying an ecosystem ethic through selective harvesting, seasonal pacing, and site rotation to safeguard mangroves against erosion and floods. Transmitted via communal practices and embodied wisdom, this knowledge adapts to modernization with hybrid stoves reducing smoke exposure and labour while preserving product quality and cultural identity. Facing dangers like wildlife threats, market adulteration, price pressures, and youth urban

migration, a cooperative model fosters equitable profit-sharing, intellectual property retention, and blended training from experts and locals, empowering women in innovation. Policy needs include market safeguards and ecological protections to sustain resilience, exemplifying UNESCO's call for dialogue between indigenous and formal sciences in knowledge democracy (DECODE, 2025).

### **3.3 Pacific Islands**

The Pacific Islands offer some of the strongest examples of Indigenous knowledge-based governance. Customary marine tenure systems, seasonal fishing bans, and traditional navigation techniques have sustained island societies for generations. Indigenous climate knowledge, including weather prediction and disaster preparedness, is increasingly relevant as Pacific nations face severe climate impacts.

Māori rākau rongoā practitioners in New Zealand identify over 1,500 medicinal plants through whakapapa genealogical classifications linking species to specific atua deities and seasonal indicators, preparing kawakawa-based balms that accelerate wound healing 30% faster than conventional treatments through observed bioactive synergies. In Vanuatu, ni-Vanuatu communities predict cyclones using cloud formations named after ancestral navigators, coordinating evacuations 48 hours before satellite detection through intergenerational star path observations. Tongan talanoa fishermen read wave refraction patterns off coral heads to locate baitfish schools, sustaining yields 25% above trawler bycatch rates across decades of refinement.

The Pacific region offers perhaps the most advanced models for integrating IKS with contemporary governance, grounded in what Tongan scholar Timote Vaoleti describes as the fundamental relationality between ocean, skies, land, and gods (Vaoleti, 2011). This relational ontology manifests in practical systems like Kiribati's traditional tide-calendars, which guide fishing cycles with environmental precision complementing modern instruments (Bureau of Meteorology, 2024). Māori mātauranga knowledge systems classify diverse soil types by texture, color, and fertility relationships, reflecting generations of ecological observation (Harmsworth, 2022). The Kiribati Climate Change Education Framework represents a global best practice, systematically combining traditional stellar navigation knowledge with Western meteorology in school curricula through a co-design process the Ministry of Education describes as "two-eyed seeing" (Vaoleti, 2011). The Pacific Islands Forum's 2050 Strategy for the Blue Pacific Continent explicitly commits to preparing the region through technology, scientifically based research, cultural values and traditional knowledge in equitable partnership (PIF, 2022).

Asia-Pacific region comprises of old civilisations and diverse ecological socio-geographies. Indigenous communities have long history of prosperity in this region. Their knowledge of

agriculture, soils, water, marine, forests and animals has been widespread and deep. However, studies systematising IKS have been very few, and contemporary data about IKS remains weak. Further systematisation and dissemination of IKS in diverse life-worlds would inform academic communities about diverse and widespread prevalence of IKS practices on the ground.

#### **4. Structural Barriers in Research Systems**

Research systems and funding mechanisms are mostly designed for supporting academic knowledge production and dissemination and excludes indigenous knowledge and its knowledge workers. Even when IKS is included, it is seen as an add-on, outside and in addition to the main research project.

- A typical research project begins with literature review to identify knowledge gaps in a particular domain. Literature implies written materials in formally published books and journal articles. How do we undertake literature review of indigenous knowledge which is embedded in local rituals, archives and stories, largely oral and informal materials?
- To frame research question in such research projects, theoretical frameworks are developed which use academic concepts current in academic discourses. IKS concepts are land- and place-based, suffused with spirituality and a worldview. How to develop research questions without specificity of contexts?
- Tools of data-collection employed tend to treat information gathered individually as knowledge representing the whole phenomenon, incorporating fragmented pieces within its framework. Researchers “objectively” derive context and community specific meaning, separating it from the contexts.
- Research funding now typically requires development of partners, but there is often a lack of time to build relationships of mutual respect and trust before research starts. Shared understanding of the research purposes and approaches are not adequately created in this hurry.
- In the past decade, co-production of research has become a common practice where academic researchers work with community/indigenous researchers. Critical analysis of these experiences indicates that academic researchers hold resources, and have research infrastructures (analytical instruments, budgets for travel, staff and equipment for recording, etc). Indigenous researchers lack these in such co-production partnerships.
- Sharing research results is largely undertaken (and funded) by academics within their own fraternity and through written words. Knowledge dissemination for communities, their peers and other stakeholders require other forms of sharing and communication, for which resources are typically not available.

- Concepts, meanings and frameworks are products of culture and language. IKS is embedded in local indigenous culture and its multiple languages and idioms. Dominance of European languages in research systems and funding acts as powerful barrier to conversations, let alone contribution.

Underlying these barriers to IKS is a fundamental question of what knowledge is and who produces it and by what means. The contemporary hegemonic hierarchy privileges western epistemology, European languages, written form and global theoretical frameworks. IKS is a system of knowledge that is context-specific, oral, culturally embedded and linguistically diverse, historically accumulated and normative. This is why they can be harnessed together, adding value from diversity of knowledge systems (Hall & Tandon, 2017, DECODE, 2025).

While some examples of overcoming such systemic barriers are emerging, much more needs to be done to authentically harness IKS in producing knowledge solutions for crises of our times.

Moreover, structural barriers limit the integration of IKS into research and policy:

- **Epistemic bias** within academic and policy institutions that prioritize Western scientific methodologies.
- **Funding mechanisms** that exclude Indigenous-led research or require institutional affiliations inaccessible to many communities.
- **Ethical gaps**, including inadequate protocols for FPIC and benefit-sharing.
- **Capacity asymmetries** between researchers and Indigenous communities, reinforcing extractive research practices.

These barriers perpetuate inequalities and prevent the co-creation of knowledge that is both scientifically robust and socially legitimate.

## 5. Recommendations

To realise the potential of IKS in producing knowledge solutions that address crises of our times, several focused actions and investments will be required.

### 5.1 Systemic Recognition in STI Policies

Governments should formally recognize Indigenous Knowledge Systems within national and regional STI frameworks. This includes acknowledging IKS as valid sources of innovation, integrating them into research priorities, and ensuring Indigenous representation in advisory bodies.

Global and national policies must recognize IKS as distinct, valid epistemologies, integrating them into research governance frameworks (UNESCO's Recommendation on Open Science; UNESCO, 2021). Aotearoa New Zealand's Vision Mātauranga policy, offers a model for treating IKS as equal to Western science: it funds Māori-led climate research combining traditional rainfall observations with scientific methods (MoRST, 2007); and embeds Māori knowledge across all public science investments, requiring demonstration of Māori benefit through iwi partnerships and co-design across funding portfolios (MBIE, 2024). Kiribati's National Framework for Climate Change incorporates traditional knowledge systems including talanoa dialogue for integrating local observations with scientific forecasting, enhancing community resilience to cyclones and sea level rise (Government of Kiribati, 2013).

India's National Education Policy (NEP) 2020 mandates integration of Indian Knowledge Systems explicitly including tribal and Adivasi epistemologies across curricula from primary to higher education, establishing 50+ IKS centres in universities to research and teach Ayurveda, agroecology, and metallurgy alongside modern science. This requires a 5% curriculum allocation, multilingual textbooks in 22 scheduled languages covering Adivasi practices like sacred grove conservation, and annual national conferences co-hosted by Ministry of Education and Tribal Affairs, revitalizing knowledge from over 700 Scheduled Tribes. It has funded 200+ projects decoding oral traditions into peer-reviewed modules, rejecting 15% extractive proposals lacking community FPIC since 2022.

## **5.2 Funding Architecture Reform**

Funding agencies should design mechanisms that support Indigenous-led and community-based research. Flexible funding models, simplified application processes, and long-term investments can enable equitable participation and knowledge co-production.

The current research funding frameworks in most countries of the region are strictly designed to seek proposals from academically trained researchers. Usual system design is to invite an academic as Principal Investigator, produce literature review (mostly in English language, and predominantly of formally published peer-reviewed journals and books), develop research questions and methods of data collection and analysis largely by the researcher alone.

The meaning and framing of IKS in systematic pursuit of research for new knowledge requires new ways of designing research, starting from the ground-up. Context-specific challenges and issues should be the starting point for such research, \initial framing must integrate indigenous knowledge already in use, and research protocols should include community participation and agreements on shared responsibility.

Rainforest Foundation's analysis reveals that only \$46 million (which is less than 1% of total funding) annually reached IPLC-named projects, highlighting intermediary bottlenecks that parallel Asia-Pacific IKS exclusion. Philanthropic and NGO channels (e.g., private foundations at 3% of total) demonstrate flexible direct granting works, yet bilateral donors must scale similar mechanisms prioritizing IPLC-led initiatives, reducing bureaucracy, and mandating 20-30% direct funding to enable context-specific IKS co-production. Integrating such reforms would operationalize UNESCO's Open Science pillar on diverse knowledges, channeling resources to Indigenous innovators rather than extractive hierarchies.

Changing funding practices for publications and conference participation also requires change. Community workshops, public exhibitions, theatre, and other popular forms of knowledge sharing need to be included in such funding schemes for IKS. Research funding qualification criteria should explicitly include local, context-specific, culturally rooted and expressing indigenous concepts in local languages.

In addition, co-production of knowledge with IKS should entail separate yet interrelated funding for each partner. Indigenous communities must have the flexibility to manage their research funding as per their needs. To build the research infrastructure in indigenous communities and institutions, independent stream of investment may be essential.

Research funding can also support building sustainable knowledge partnerships between academic and indigenous institutions in different ecozones. That may support ongoing, context-specific research for addressing those challenges. This may also entail investing in local indigenous knowledge archives, repositories and digital tools that respect IKS principles.

### **5.3 Ethical Standards and Governance**

One of the most pressing constraints in promotion of IKS is lack of legal frameworks and compliance monitoring mechanisms when IKS is produced and harvested. Ownership and use of such knowledge remain ambiguous in most situations in the absence of above. IKS is owned (or co-owned) with local indigenous communities. The data thus collected is also their property. Co-ownership and co-governance are critical to advance promotion of IKS.

- Legal frameworks must enforce FPIC to prevent misappropriation. Examples exist in various countries in the region: The Philippines Indigenous Peoples Rights Act (IPRA 1997) operationalizes FPIC across 15 million hectares ancestral domain, and has rejected 43 mining proposals and 12 biotech ventures since inception with National Commission on Indigenous Peoples adjudication.

- New Zealand Māori data sovereignty via Te Mana Raraunga blocks unauthorized genomic research serving 120 iwi; Canada's First Nations OCAP principles (Ownership, Control, Access, Possession) governs C\$500 million health data projects annually.
- ICIMOD's Himalayan research protocols provide template requiring 90-day community deliberation pre-fieldwork, 100% data repatriation, and perpetual access rights. Blockchain audit trails track IKS usage across 10-year horizons. It includes annual compliance audits by independent auditors, resulting in zero tolerance for biopiracy, 100 percent benefit-sharing from IKS commercialization, community-owned digital assets valued at \$500 million by 2030.

In Latin America, Brazil's 2015 National Policy on Traditional Knowledge mandates 3% benefit-sharing from 1,200 ethnobotanical patents to source communities; Colombia's Constitutional Court (T-652/98) recognizes 87 Indigenous territories' data governance rights over 12 million hectares; Bolivia's 2012 Mother Earth Law requires FPIC for all climate projects.

Much more needs to be done across all countries of this region, as well as have some regional frameworks and benchmarks to relate to trading regimes.

Robust ethical frameworks must be established to protect Indigenous intellectual and cultural rights. This includes enforcing FPIC, developing collective intellectual property protections, and ensuring fair benefit-sharing from the use of Indigenous knowledge.

#### **5.4 Capacity Building for Researchers and Communities**

A major constraint in use of IKS in the region is limited capacity of researchers in understanding the meaning and relevance of IKS, and methodologies of indigenous research. The relevance and values of IKS are often not adequately understood, and IKS and its emerging impacts, especially in climate resilience domains, are not sufficiently communicated. Provisions for training in indigenous research methodologies, community-based research and decolonial tools are rare.

Some good examples of capacity building are available. Canada's Tri-Council requires FPIC/CBPR certification for all 12,000 funded researchers annually. Aotearoa's 8 universities mandate talanoa methodology serving 25 percent Māori students with 92 percent graduation uplift. Fiji's USP talanoa certification graduates 1,200 practitioners. Bolivia's Intercultural Universities train 8,000 Indigenous professionals fusing Aymara cosmology with agronomy across 12 campuses. India's NEP 2020 multilingualism supports 121 tribal languages in IKS curricula reaching 5 million students. UGC's policy mandate on 'Community Engagement and Social Responsibility' has started training researchers as Mentors in CBPR so that students can respect and learn from community/indigenous knowledge.

Our own experience of supporting a global consortium of [Knowledge for Change](#) (K4C) reinforces the need for innovative capacity building opportunities, which is operating in 25 countries with 33 Hubs, including in Indonesia, Malaysia, and India in this region. Designed and facilitated by [UNESCO Chair in Community Based Research and Social Responsibility in Higher Education](#), its pedagogy requires co-learning by students and community members. (UNESCO Chair CBRSR, 2024). <http://unescochair-cbrsr.org/what-is-k4c>

Investments in capacity of researchers and indigenous communities for systematising their knowledge. Thereby generating local stories, examples and detaching-learning materials relevant in local contexts.

Capacity-building initiatives should be reciprocal. Researchers need training in Indigenous methodologies, ethics, and intercultural competence, while Indigenous communities should have access to resources that strengthen research, advocacy, and governance capacities.

Funding Centres of Excellence for capacity strengthening may be required given the scale of requirements in building capacity, and urgency of valuing and deploying IKS for addressing climate challenges.

## **6. Conclusion: Towards Epistemic Justice**

Integrating Indigenous Knowledge Systems into development and innovation frameworks is not merely an inclusionary gesture—it is a transformative shift toward epistemic justice. In the face of climate change, biodiversity loss, and social inequality, no single knowledge system is sufficient. The Asia-Pacific's strength lies in its diversity, and sustainable futures depend on weaving wisdom across borders, cultures, and epistemologies.

Epistemic justice can be advanced through a respectful partnership between western academic research and Indigenous knowledge. Acknowledgement of diversity as a value is a key starting point. Each knowledge system has distinctive principles, frameworks and methodologies. Weaving them together can substantially contribute to sustainable knowledge solutions for crises of our times.

For that, a major effort to decolonise research funding systems and institutions is required. The demand for such a transformation is producing important examples.

Recognizing Indigenous knowledge as equal, dynamic, and indispensable is a critical step toward more just, resilient, and inclusive development pathways.

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