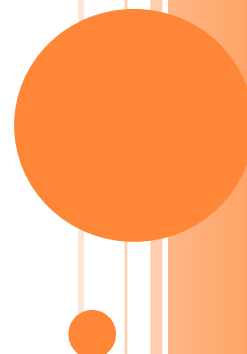


# INDIGENOUS WOMEN & SCIENCE KNOWLEDGE

## *The First Voice and Climate Change*

When we talk about science knowledge, we often neglect the contribution of indigenous peoples: particularly indigenous women. With nearly 200 million indigenous women at the front line of climate change, their science knowledge is complementary, instructive and vital to scientific research in the “Global North”. The “First Voice” of indigenous women is central to building ecological resilience and steering international action on climate change mitigation.

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*The First Voice and Climate Change*



Valerie Kasaiyian (left), of Kenya, addresses a press conference on the empowerment of indigenous women at the United Nations, New York: March 2016. UN photo/Eskinder Debebe

### 70 DEGREES 30 MINUTES NORTH: NUNAVUT, CANADA

An adventurous traveler, journeying through the Arctic wilderness of Nunavut, may find the most pragmatic means of transport to be dogsled or snowmobile. Most of Nunavut has no formal roads: this most northern territory of Canada is among the most sparsely inhabited regions of the world, its populace of 35,000 dotted over an area the size of Western Europe. Voyagers to the pristine Arctic terrain will spot ghostly, playful beluga whales in the crystal waters, caribou crossing the tundra valleys and polar bears roaming on the ice pack.

Nunavut caught the attention of international media in September 2016, when news broke that the [wreck of HMS \*Terror\* had been discovered](#) resting in 80 feet of icy water south of King William Island. Missing for 168 years, the *Terror* was used by polar explorer Sir John Franklin on his doomed expedition to traverse an uncharted route through the Northwest Passage. Dozens of newsmedia websites beamed spectral images of the long lost *Terror* across the world, its bowsprit, bell and double wheeled helm remarkably well preserved. Ironically, thanks to the region's slow, unreliable and ruinously expensive internet, [poignant pictures of the \*Terror's\* fate](#) likely proved elusive for many a local Nunavummiq.

Inuktitut, the language of the 25,000-strong indigenous Inuit population, contains a [rich and descriptive lexicon for sea-ice and snow](#). In a region where temperatures range from minus 40°C in winter to 30°C in summer, daily life and safe passage is navigated through nuanced articulation of sea-ice and snow variations. *Siku* refers to ice in general, while *qinu* refers to slushy ice by the sea. *Maujaq* is snow that one sinks into, while *qautsaullittuq* describes ice that has been broken after its strength is tested with a harpoon.

In 2007, however, an Inuit Clyde River Elder, Attakalik Palluq [described to researcher Shari Gearheard](#) the devastating impact of climate change on their lexicon. *Qiqqsuqqaqtuq* describes a process during spring, where the top layer of snow usually refreezes during the night. The sparkling frozen top layer, Palluq explained, is normally visible as daylight breaks. During her skidoo and dog team journeys, Palluq had observed that the freezing process just wasn't happening like that anymore. In 2014, Charlie Bird, [reporting for The Irish Times](#), cited two Nunavut male Elders witnessing local glaciers they've known since they were young men getting smaller and smaller.



View of the Polar ice rim. UN Photo/Mark Garten

Climate change's impact across the Arctic region is not uniform: its effect on ice-dependent animals, acceleration of sea-ice breakup and disruption of insect and flora migratory patterns can vary substantially. In their brilliant 2010 paper, "Should we turn the tent? Inuit women and climate change", Gearheard and colleagues Martha Dowsley, Noor Johnston and Jocelyn Inksetter describe the importance of Inuit women's knowledge and observations in making sense of climate change across a vast landscape. Honed from interaction with nature, Inuit women's scientific knowledge includes weather patterns, animals, berries and insects: vital for monitoring localised changes. In contrast with Western European modes of science discovery, Inuit knowledge does not dichotomise nature and the self as separate projects. Rather, as with indigenous people around the globe, knowledge emerges from participation in nature rather than separation from it.

According to the World Bank, [80 per cent of the planet's biodiversity](#) lies within territories and lands of indigenous peoples, whose customary usage and management of ecosystems and lands are grounded in principles of sustainability. However, the territories of indigenous peoples are often located in areas most severely impacted by climate change: the Arctic, savannahs, forests, the Small Island Developing States (SIDS) and wetlands.

Globally, indigenous women number about 170 million but are among the world's most marginalised groups, vulnerable to racism, violence and social and economic inequality. Despite a low ecological footprint, they're often directly dependent on natural resources for their livelihoods and suffer an inequitable burden of climate change impact.

Indigenous women's tasks in their communities include biodiversity management, custodianship of seeds, keeping sophisticated water management systems, traditional medicinal knowledge and agricultural technological know-how. Their knowledge systems and ecological resource management methods are gained over millennia, empirically tested in their communities and transmitted orally down through generations. Nevertheless, outside of ethnography, anthropology and the social sciences, indigenous knowledge and experiences - especially women's - are often overlooked by science research in the more materially wealthy and developed "Global North".

Ecology, however, knows no geopolitical boundaries. The importance of indigenous people's ecological and environmental experience and expertise is increasingly recognized by the United Nations: it is a key tool of the UN [2030 Sustainable Development Goals](#). As transmitters of culture, knowledge and tradition within their communities, indigenous women are central to climate change mitigation, biodiversity conservation and disaster risk preparedness.

*14 DEGREES 15 MINUTES SOUTH: LARAMATE DISTRICT, PERU*





Crops grown by indigenous women farming in the Laramate district of Peru are thriving, thanks to ancestral farming techniques. Photo courtesy of CHIRAPAQ.

9,000 kilometres from Nunavut, in the Laramate district of Peru, unseasonal drought and frosts wrought by climate change have caused mainstay crops to wither and rot. Despite being responsible for just [0.1% of global CO2 emissions](#), Peru is among the countries most severely affected by climate change, with glacial melt in the Andes and forest degradation in the Peruvian Amazon causing increasingly unpredictable weather patterns. With [support from the UN Women's Fund for Gender Equality](#), the organisation *Centro de Culturas Indigenas del Peru* (CHIRAPAQ) implemented a crop cultivation programme for indigenous women in the Laramate district, to help ensure food security for their community. The women used their ancestral legacy of indigenous agricultural technology to rotate crops, rest the land and select higher quality seeds. The result was a higher and more diverse yield with greater weather resilience, with an added

benefit of boosting women's incomes. Some of the farmers sell their surplus produce in local markets, the extra revenue giving them more financial independence and building their self-esteem.

*18 DEGREES 50 MINUTES NORTH: YUCATAN PENINSULA, MEXICO*

In the Yucatan peninsula of Mexico, the stingless *Melipona beecheii*, or Melipona bee, has been prized since the Maya civilisation. The bees were considered sacred in Mayan culture: a dedicated Bee-God, [Ah Muzen Cab](#), is often depicted with a clutch of honey pots in his hands. The gentle, native Melipona bee's honey has been used in traditional medicine for thousands of years and has antibiotic and antiseptic qualities. Unlike *Apis mellifera* the European honey bee introduced by the colonial Spanish in the 1700s, the Melipona bee [pollinates native forest canopies](#) and restores ecological balance. They are vital to maintaining forest integrity in a region increasingly vulnerable to climate change and rising sea levels: forest fragmentation lowers ecological resilience and habit recovery after major natural disturbances. In 2005, the Smithsonian Tropical Research Institute [reported finding only 90 Melipona beehives](#) the previous year in the Yucatan peninsula. The non-indigenous European Honey bee produces a far greater yield of honey and is favoured by male bee-keepers of Yucatan.

A women-only Yucatan-based organisation, the Co'oleel Caab Collective, has mastered beekeeping as a way of repopulating the supplanted Melipona bee and generating extra income for families. Beekeeping was traditionally a male task in Mayan culture, but Anselma Chale Euan, President of the Co'oleel Caab Collective, [explained](#) how she realized there was no longer anyone to rescue the bees. If she didn't do something, it would be too late. She and 19 other indigenous women, working in Xuba'an Kab, harvest around 50 liters of honey a year, caring for around 20,000 bees. Their work generates extra income through selling natural remedies based on bee-products, such as honey, wax and herbs. The threat to agriculture caused by declining bee populations is a huge global crisis: [a third of all food eaten worldwide depends on pollinators](#). Bees are particularly vulnerable to climate change: severe weather events combined with

changing plant life cycles, monoculture and pesticides are among [myriad problems](#) wrought on global bee populations. The adaptive Yucatan indigenous women will be central in conserving the Melipona bee: [similar programmes](#) have already been championed by the United Nations World Heritage Alliance.

#### *LISTENING TO THE "FIRST VOICE: SCIENCE AND THE "SELF"*

In November 2010, 80 indigenous women from 60 indigenous nations and peoples gathered in Manila, Philippines for the Global Conference on Indigenous Women, Climate Change and [REDD Plus](#). Sharing knowledge and experiences on climate change adaptation and mitigation, they described the inequitable burden brought upon them by western consumerism and the commoditisation of nature. The [Mandaluyong Declaration](#), released on the back of the conference, stated:

“While we have least contributed to the problem of climate change, we have to carry the burdens of adapting to its adverse impacts. This is because of the unwillingness of rich, industrialized countries to change their unsustainable production and consumption patterns and pay their environmental debt for causing this ecological disaster”.

[Kyle Powys White](#) points out that science must also serve indigenous women; redeployed to serve the knowledge and needs of indigenous communities, listening to the “First Voice”. Models of science research must also serve their goals, not just those established in the “Global North”. Anthropogenic climate change is the ultimate failure of modern “progress” - the separation of nature and the self. Taking the lead of indigenous women, science knowledge honed from our natural world cannot remain just a body of insights, separate from daily life, but should be embedded in how one actually lives.