



# IS TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) THE 'KEY' TO FIGHTING AGAINST CLIMATE CHANGE?



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## Climate change

Climate change, often debated in terms of its causes and severity, fundamentally refers to the amount of heat being added to the Earth's system. Climate change involves long-term shifts in temperatures and weather patterns, primarily driven by human activities such as the burning of fossil fuels like coal, oil, and gas (Dessai, 2004). Deforestation is another significant cause of climate change, as it contributes to the increase of greenhouse gases in the atmosphere by reducing the number of trees that absorb carbon dioxide (Longobardi et al., 2016).

Greenhouse gases naturally play a crucial role in insulating the Earth, acting like a warm blanket to maintain a stable climate. However, the problem arises when human activities significantly contribute to the increase of these gases, causing the Earth to heat up – an issue we are currently facing. The excess of greenhouse gas emissions is leading to global warming and widespread environmental impacts, including more frequent natural disasters such as hurricanes, droughts, and wildfires (Benevolenza & DeRigne, 2018).

report on their progress, fostering transparency and accountability in the global response to this urgent challenge.

Climate change can affect our health, safety, working conditions, ability to grow food and gain secure housing. Some people are already more vulnerable to climate impacts, such as those living on small islands or in developing countries. Rapidly rising sea levels and saltwater intrusion are leading entire communities to relocate, while prolonged droughts are

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***Indigenous communities are among the most vulnerable to climate change, as their livelihoods and cultural practices are deeply connected to local ecosystems.***

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The Paris Agreement of 2015 (United Nations Framework Convention on Climate Change [UNFCCC], 2015) was the first global treaty on climate change to impose policy obligations on all countries. It represents a hybrid model, incorporating both bottom-up and top-down approaches to global climate governance (Bodansky, 2011). In response to this global crisis, the Paris Agreement aims to strengthen international efforts to effectively combat climate change by limiting global temperature rise to well below 2 degrees Celsius above pre-industrial levels. Additionally, the Agreement encourages further efforts to limit the increase to 1.5 degrees Celsius, recognising the importance of mitigating the worst impacts of climate change. The Agreement also establishes a framework for countries to set their own Nationally Determined Contributions (NDCs) and to

increasing the risk of food scarcity for many people. In the future, the number of people displaced by weather-related events is expected to rise. For many communities, the impacts are felt most strongly by indigenous communities who rely on natural ecosystems for their livelihoods as these changes threaten their food security, access to water, health, and economic stability, making the need for adaptation and mitigation strategies ever more critical.

**What is traditional ecological knowledge (TEK)?**

“Traditional ecological knowledge [refers to] ... a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and

with their environment.” (Berkes, 2017, pp. 7-8)

Hosen et al. (2020) assert that the definition of traditional ecological knowledge (TEK) espoused by Western scholars and indigenous communities differs. This difference in perspective reflects the diverse ways in which TEK is understood and applied across cultures.

deeply connected to local ecosystems (Schlingmann et al., 2021). Their reliance on natural resources, geographic isolation, and limited access to adaptive infrastructure further increase their susceptibility to environmental shifts. However, their extensive knowledge of the environment offers valuable perspectives for resilience and adaptation.

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Western scholars view TEK as a cumulative body of knowledge, practices and beliefs, passed down through generations via cultural transmission, and involving the relationship between living beings and their environment (Berkes, Colding, & Folke, 2000). In contrast, indigenous communities define TEK as the complexity of their cultural knowledge systems, notably with regards to their ethics of living and value system. In essence, they express TEK as a “way of life”, rather than just a form of knowledge about how to live (McGregor, 2004). TEK, therefore, represents a core aspect of indigenous culture, and is deeply intertwined with their traditions and worldview.

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Reyes-García et al. (2024) state that TEK plays a critical role in climate change adaptation, providing localised, sustainable approaches in managing natural resources as well as coping with environmental shifts. Indigenous communities possess invaluable traditional knowledge that can inform effective climate action and adaptation strategies. For instance, the Semelai people in Pahang state, Malaysia, apply traditional ecological knowledge to determine the fertility of the forested land, considering trees whose trunks cannot be encircled by an arm span as fertile enough for planting (Man & Halim, 2022). Their responses to climate change are often context-specific, utilising local resources and inter-generational knowledge.

## **Integrating TEK into climate adaptation**

TEK promotes environmental sustainability through practices that have evolved over time, enhancing biodiversity and fostering community cohesion (Priyadarshini & Abhilash, 2019). This knowledge system integrates cultural, spiritual, and ecological aspects, offering a holistic approach that contrasts with conventional scientific methods.

As the world grapples with the challenges posed by climate change, it is imperative to bridge the knowledge gap between TEK and scientific research. By incorporating TEK into modern environmental management strategies, via collaborative efforts between indigenous communities and researchers, we can develop more holistic and inclusive responses to mitigating the impacts of climate change (Akbar et al., 2020; Nabhan, 2020; Nalau, 2018).

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***The integration of TEK into policy frameworks can thus facilitate a more comprehensive understanding of local ecosystems and promote practices that have proven effective over time.***

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For instance, indigenous communities in Southeast Asia have historically adapted their agricultural practices to cope with climate variability, demonstrating the resilience and adaptability of TEK in the face of changing environmental conditions (Fonseca-Cepeda, 2019). Notably, indigenous communities in Malaysia have long utilised TEK to adjust agricultural cycles and recognise seasonal changes, which complements modern meteorological forecasts (Man & Halim, 2022).

This intergenerational knowledge not only enhances agricultural resilience but also underscores the importance of TEK in informing climate adaptation efforts (Fawzi, 2016). The integration of TEK into policy frameworks can thus facilitate a more comprehensive understanding of local ecosystems and promote practices that have proven effective over time (Min, 2019).

As the world grapples with the challenges posed by climate change, it is imperative to bridge the knowledge gap between TEK and scientific research. By incorporating TEK into modern environmental management strategies, via collaborative efforts between indigenous communities and researchers, we can develop more holistic and inclusive responses to mitigating the impacts of climate change (Akbar et al., 2020; Nabhan, 2020; Nalau, 2018). Ultimately, this synergy can empower communities and strengthen our ability to adapt to an ever-changing world, highlighting the critical role of TEK in sustainable development (Molnár, 2016).

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