Land, Legacy, and Learning:
Indigenous and Traditional Knowledge Systems and EbA.

Contributions:
Concept and writing: Dinah Awino
Writing and Data Curation: Nancy Nyambura

Indigenous knowledge (IK) has long been the backbone of sustainable living. The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) refers to Indigenous peoples as *a community of peoples sharing inter-generational ancestry and cultural aspects with original (pre-colonial) occupants of ancestral lands in a specific region of the world and recognizes the need for respective peoples to have autonomy in defining themselves as Indigenous"*. Indigenous Knowledge refers to the understandings, skills, and philosophies developed by societies with long histories of interaction with their natural surroundings (Ford et al., 2020). Indigenous knowledge systems (IKS) have long been recognized as valuable resources in climate change adaptation(Dorji et al., 2024). These systems encompass the traditional practices, beliefs, and insights developed over generations within Indigenous communities. They offer unique perspectives on environmental management and resilience, often complementing scientific approaches. At the global level, the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) acknowledge the importance of Indigenous Knowledge to climate adaptation (Nalau et al., 2018). Indigenous communities collectively shape adaptation strategies through traditional governance structures and communal efforts.

Involving Indigenous people and local communities is perceived as important not only because it makes conservation more equitable, but also because it has the potential to produce better biodiversity outcomes for more effective conservation activities (Dawson et al., 2021).

A UNEP report called, The Harnessing Nature to Build Climate Resilience, notes that Indigenous Peoples (IP), local communities, and women have the potential to lead global EbA efforts, benefiting from their dependence on ecosystems. Their extensive knowledge of local contexts contributes valuable insights to culturally appropriate localized EbA initiatives.

Adido is a young woman from Thome, a highland community in Nyeri, Kenya, where Indigenous knowledge plays a crucial role in adapting to climate change. She grew up learning from her grandmother, Mama G, a respected livestock farmer whose deep understanding of Kikuyu traditions and local ecosystems shaped sustainable farming practices. Faced with erratic rainfall and dwindling river flows, she embraced Ecosystem-Based Adaptation (EbA) techniques. Mama G planted Indigenous trees alongside crops to improve soil fertility and

prevent erosion, constructed small reservoirs to collect water when it rained for irrigation during dry spells and worked with the community to restore vegetation along riverbanks, reducing siltation and ensuring a steady water supply for both farming and livestock. By integrating agroforestry, rainwater harvesting, and riparian restoration, she worked tirelessly to adapt their practices to the changing climate. This system, called agroforestry, was a way of making sure their land provided food even when the rains failed. "*If we plant more trees, they'll shelter our crops, keep the soil from drying, and even give our cattle food,*" she would say, teaching Adido the importance of living harmoniously with nature.

Mama G relied on ancestral knowledge passed down through generations to respond to environmental challenges. While she may not have known the term Ecosystem-Based Adaptation (EbA), her traditional practices—such as planting indigenous trees for soil fertility, constructing small reservoirs to conserve rainwater, and restoring vegetation along riverbanks—align with EbA principles. These methods, deeply rooted in the community, demonstrate how Indigenous knowledge can serve as a foundation for climate resilience, even without formal scientific framing.

Her efforts in promoting EbA, coupled with raising bees and growing native herbs, provided a steady income and ensured their land remained productive. Her legacy continues through Adido, who now passes on these invaluable lessons, showing that even in a changing world, traditional knowledge, and innovative practices can create a future that honors both the land and its people. Mama G often recounted stories from her childhood, highlighting the importance of respecting and working with the environment. She would say. "*Our ancestors knew how to live with the earth, not fight against it. It's time we remember those lessons.*" Her wisdom and practical knowledge have become a cornerstone for the community, blending traditional methods with modern ecological practices to build resilience against climate change. Mama G's efforts were more than just survival techniques; they were acts of hope for the future. "*Every tree we plant is a promise to our children*," she often told Adido. "*It's a promise that they will have a future where the land is still bountiful*." This commitment to future generations has inspired the entire community, showing that indigenous knowledge is not just about the past, but about securing a sustainable future.

In the agricultural sector, where Indigenous Knowledge is employed to enhance climate change adaptation and resilience among Indigenous farming communities, five key themes emerge. These include the use of climate-smart crop varieties, adjusting planting and harvesting times, crop rotation and intercropping, optimizing agricultural methods, and traditional storage techniques (Dorji et al., 2024).

Traditional storage methods are an age-old practice prevalent among Indigenous communities, who are particularly vulnerable to climate variability due to limited resources. For instance, in Kisumu County, Kenya, and Eastern Cape Province, South Africa, grains are preserved by

hanging cobs in smoky areas or mixing grains with ash and storing them in pots sealed with cow dung to protect against weevils and enhance germination rates (Apraku et al., 2021). In Kilifi County, Kenya, tubers and grains are sun-dried and stored in a traditional structure called a *lutsaga*, built above the cooking stove to safeguard the harvest from pests. These practices collectively strengthen climate change adaptation and resilience by enhancing the adaptive capacities of Indigenous communities through the application of IK.

The use of IK systems for weather forecasting has been crucial for the survival of Indigenous communities, helping mitigate climate change impacts through early preparedness and enhancing local adaptive capacity. Indigenous peoples also utilize social, biophysical, and ecological indicators to predict weather and warn of impending disasters. They observe the behavior and appearance of insects, plants, birds, animals, moon-star alignment, animal intestines, tidal flow, snowdrifts, and current directions, among other signs. This knowledge informs traditional seasonal calendars, which are intricate, locale-specific systems based on environmental observations. These calendars guide community activities, dictate social behaviors, and help predict events like seasons, floods, storms, large waves, and droughts. Different Indigenous communities have unique disaster forecasting methods. For example, in Ethiopia's Dejen community, drought is signaled by dry fog, north-to-south dry winds, or wind following rainy days. In Kilifi County, Kenya, rain forecasts are based on dark clouds gathering or ducks flapping their wings and bathing in the sand, while the Dejen community associates rain with a clear sky and a screeching eagle or a moist north-to-south wind signaling the onset of the short rainy season (Dorji et al., 2024).

Several studies in Africa have shown the essential role of local institutions in supporting local adaptation strategies by providing weather forecasts, facilitating information exchange, and managing resources. To effectively include Indigenous people, the government should collaborate with Indigenous organizations, associations, and groups. Thus, government offices and donor agencies should avoid dictating development plans for Indigenous communities and instead involve them in drafting developmental agendas and policies for climate change adaptation and resilience. For example, in Wajir-bor County in the northeast of Kenya, the County Climate Change Fund (CCCF) funded the construction of a dam, along with a water tank, pump, animal trough, and fence. This project was selected by the 13 Wajir-bor Ward committee members, five of whom are women. Women's participation in these projects increases their decision-making power on water scarcity issues, which directly affect many livelihoods. This is particularly significant for ethnic Somali women in Wajir-bor, who are traditionally excluded from leadership roles but have found a voice through these projects The project has improved water access regulation and prolonged water storage, enhancing tariff collection and water quality (Chaudhury et al., 2020). Strengthening local governance institutions is crucial to benefit from IK.

In conclusion, adapting to climate change presents a major societal challenge, made all the more difficult by the uncertainty of future impacts and issues surrounding climate justice (Petzold et al., 2020). The timeless wisdom, embodied by Mama G and countless other Indigenous Knowledge keepers offers tremendous resources in the fight against climate change. IK, rooted in centuries of observation and experience, wealth of wisdom that can complement and enhance modern scientific approaches. Their experiences underscore the importance of respecting/including/ indigenous knowledge in shaping effective adaptation policies. By recognizing the valuable insights and practices of Indigenous communities, policymakers can make informed decisions and develop strategies that are both culturally appropriate and environmentally sustainable (Van Huynh et al., 2020).

Call to Action

Amplify Indigenous voices and knowledge. Invest in participatory research, support Indigenous EbA initiatives, and integrate traditional ecological knowledge into modern solutions.

References

Dorji, T., Rinchen, K., Morrison-Saunders, A., Blake, D., Banham, V., & Pelden, S. (2024). Understanding How Indigenous Knowledge Contributes to Climate Change Adaptation and Resilience: A Systematic Literature Review. Environmental Management, 74, 1101-1123.

Ford, J. D., King, N., Galappaththi, E. K., Pearce, T., McDowell, G., & Harper, S. L. (2020). The resilience of indigenous peoples to environmental change. One Earth, 2(6), 532-543.

Petzold, J., Andrews, N., Ford, J. D., Hedemann, C., & Postigo, J. C. (2020). Indigenous knowledge on climate change adaptation: A global evidence map of academic literature. Environmental Research Letters, 15(11), 113007.

Van Huynh, C., Le, Q. N. P., Nguyen, M. T. H., Tran, P. T., Nguyen, T. Q., Pham, T. G., ... & Trinh, H. N. (2020). Indigenous knowledge in relation to climate change: adaptation

practices used by the Xo Dang people of central Vietnam. Heliyon, 6(12). 10.1016/j.heliyon.2020.e05656

Why Indigenous and Traditional Knowledge in EbA? (2023, June 20). Global EbA Fund. https://globalebafund.org/indigenous-traditional-knowledge/

Nalau, J., Becken, S., Schliephack, J., Parsons, M., Brown, C., & Mackey, B. (2018). The Role of Indigenous and Traditional Knowledge in Ecosystem-Based Adaptation: A Review of the Literature and Case Studies from the Pacific Islands. Weather, Climate, and Society, 10(4), 851-865. https://doi.org/10.1175/WCAS-D-18-0032.1

Apraku A, Morton JF, Apraku-Gyampoh B (2021) Climate change and small-scale agriculture in Africa: does indigenous knowledge matter? Insights from Kenya and South Africa. Sci African 12:e00821. https://doi.org/10.1016/j.sciaf.2021.e00821

Kaganzi KR, Cuni-Sanchez A, Mcharazo F, Martin EH, Marchant RA, Thorn JPR (2021) Local Perceptions of Climate Change and Adaptation Responses from Two Mountain Regions in Tanzania. Land 10(10):999. https://doi.org/10.3390/land10100999

Chaudhury, M., Summerlin, T., & Ginoya, N. (2020). Mainstreaming Climate Change Adaptation in Kenya: Lessons from Makueni and Wajir Counties. Www.wri.org. https://www.wri.org/research/mainstreaming-climate-change-adaptation-kenya-lessons-makueni-and-wajir-counties

United Nations. (n.d.). United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). https://www.ohchr.org/sites/default/files/Documents/Issues/IPeoples/UNDRIPManualForNHRIs.pdf