EEJOURNALS OPEN ACCESS

EURASIAN EXPERIMENT JOURNAL OF ENGINEERING

(EEJE) ISSN: 2992-409X

@EEJE PUBLICATIONS Volume 5 Issue 2 2025

Indigenous Knowledge in Modern Health Engineering

Awafung Emmanuel

Electronics and Biomedical Engineering, Kampala International University Uganda

Email: awafungadie@gmail.com

ABSTRACT

This paper examines the convergence of Indigenous Knowledge Systems (IKS) and Modern Health Engineering to create inclusive, culturally responsive, and sustainable health solutions. Indigenous Knowledge, a dynamic, adaptive system rooted in generations of communal experience, has historically played a pivotal role in ecosystem management, health maintenance, and disease prevention. Yet, modern health frameworks often marginalize it in favor of biomedical paradigms. Through historical analysis, case studies, ethical discourse, and policy critique, this paper investigates how Indigenous knowledge particularly it's ecological, medicinal, and spiritual dimensions can enrich health engineering practices. It emphasizes collaborative approaches, legal protections, and the importance of vernacularizing scientific knowledge for local application. The paper calls for a shift from extractive models to reciprocal partnerships that value Indigenous epistemologies and practices as essential to global health resilience, especially in an era of decolonization and sustainability challenges.

Keywords: Indigenous Knowledge Systems (IKS), Health Engineering, Traditional Medicine, Cultural Sustainability, Bioethics, Knowledge Integration, Vernacular Health Practices.

INTRODUCTION

Indigenous knowledge is a system of ideas, skills, and experiences developed by local communities that is vital for their existence. It arises from the interaction between humans and their geophysical environment, encompassing perceptions of natural surroundings and responses to them. This environment includes resources like land, soil, vegetation, and water. While applicable to all communities, indigenous knowledge is unique, having evolved locally over time. Its scientific aspect reflects its dynamic evolution, shaped through communal inquiry without written texts, accumulated across generations through experience, and woven into social structures. Communities have relied on this knowledge to predict natural disturbances such as droughts and floods. For example, distinct smells from the ground may indicate an impending earthquake, while crop planting strategies change with drought conditions. Zigzag maize planting is utilized for drought resilience, while seasonally flooded fields support crops like papyrus and cat-tail, providing resources and fodder. Before the rise of industrial insecticides, plant derivatives served as eco-friendly pest control, demonstrating effective indigenous agricultural practices [1, 2].

Historical Context

Indigenous Knowledge is organic knowledge handed down from time immemorial from one generation to the next with appropriate local institutional arrangements for preservation and transmission. It is provable knowledge pertaining to the social, cultural, economic, and spiritual spheres of life in a given locale. This form of knowledge was generative of behaviours that were not only rational but sustainable. The knowledge of the livability and ascribe values held continuously by all humans in all times and places dictated ways of being with respect to places and things, and these ways were acted out through social behaviours. Over the past two and a half centuries, globalisation has commenced in earnest and humanity currently exhibits an unparalleled capability to manipulate, and destroy its immediate environments. In

the light of these, Indigenous Knowledge systems, which are perceived as abandoned relics of former epochs in the ongoing march of civilizational progress are being critically reviewed for material, moral and epistemological lessons that countries emerging from the total destruction of their Indigenous Knowledge assets could learn from. Approaching Indigenous Knowledge from perspectives of materiality, ethics, and epistemology necessitated with their attendant implications, policy and practical actions are offered. The political ramifications of Indigenous Knowledge have necessarily to be understood within the context of broader global politics. The subheading 'indigenous' has increasingly- both in the context of the emergence of international instruments on Indigenous Knowledge, as well as the possibility of contestable claims to the purity of knowledge elsewhere, and calls for a diversity of forms in developing and deploying data and repeated renaming, 'in situ', 'distributed', 'local', 'place-based' 'folk', 'domestic', 'ethno', and 'peasant', and in fermenting, reconstituting, and mobilising knowledge [3, 4].

The Role of Indigenous Knowledge in Health

Indigenous Knowledge, often referred to as traditional knowledge, is the unique body of knowledge possessed by each community of people, and is sometimes wrongly equated with 'folklore'. It comprises the unique and cumulative knowledge, knowledge practices and beliefs evolving by adaptive processes and handed down through generations by cultural transmission. Indigenous knowledge is complex, since it is composed of philosophies, theories, methods and practices. The indigenous knowledge systems, local practices, spirituality and local beliefs are invaluable assets that help conserve ecosystems and sustain livelihoods. Over 4000 indigenous peoples, comprising nearly 300 million people, occupying every continent of the globe have been recognized as important 'sub-national' citizens. Conversely, the sine qua non of international concern about biodiversity conservation, food security, the preservation of ecological knowledge, sustainable development and maintenance of cultural diversity and socio-political stability, they comprise a minority of national populations. Nevertheless, they manage 28% of the planet's surface, implementing a wide range of sustainable extraction, harvesting, ecosystem management, conservation, and agro-technologies that promote sustainability. Traditional indigenous peoples practice processes that enhance the sustainable management of diverse ecosystems, which are viewed as agents of health. Genetic, species and ecosystem diversity increase the property of insurance within ecosystems against declines in health and productivity. The elements of ecosystems viewed as agents of health are diverse organisms and ecological processes. Diverse organisms may be viewed as reservoirs of local knowledge about organisms that affect a community's health. The mechanisms through which diversity and sustainability enhance health are studied, as are the constraints on health-engineering that enforce anthropocentric value systems. The results indicate that health engineering is possible, desirable and necessary, and that it requires a diversity of knowledge, motivation, experience, and resources to be truly sustainable [5, 6].

Modern Health Engineering

The contemporary health engineering practice and perspective of health in development have their beginnings in the World Health Organization at Geneva, Switzerland. Following its meeting in 1948, the WHO put out a charter indicating the dimensions of health in terms of capacity and functional states. Thus, it is widespread semantic application in health engineering that health refers to knowledge, perception, beliefs, attitude, and practice, and that the health sector refers to medical training, institutions, personnel, and services that ameliorate the health dimensions. Based on these assumptions, conventional health engineering designs, infrastructures, and programs have been changed into various local processes and contents. The common practices and indicators of the local processes and the contents to detect levels of change include the introduction of local health training schools, clinics, and health policies, and biomedical diagnosis, treatment, and cure of health commodities. The sustainable agency and practices of IGK systems for health and illness also provide the local processes and contents of modern health engineering. The government, medical education institutions, and NGO actors have unlearned the indigenous social process and medical culture of the health engineering. They should promote research on IGK systems, stigmatization of beliefs, and perceptions of health and mental health maladies for unity, training of users of the health engineering, integration into the curriculum of medical training, and incorporation into modern health services. The present health engineering of disease, laboratory diagnosis, and biochemical treatment has local interpretations, per local cultural and social realities. Only labels that define activities or professionals need to be vernacularized, and health engineering would get ecu results. If health engineering is viewed narrowly as activities to prevent disease, this is gross misapplication. Metanoia modifying of culture and social construction only through content change of health engineering is impractical and, if enforced, increases feelings of not belonging and lack of identity, resulting in abuses, violence, and high rates of mental illness. The paradigm assumes the universality of culture and social construction in health engineering processes. The rapid efficaciousness of global health

measures, in the absence of local vernacularizations, to make all people and cultures identical is increasingly unrealistic; cultural preventers of contagion and mortality have been widely ignored [7, 8].

Integration of Indigenous Knowledge in Health Engineering

Indigenous knowledge has long helped people navigate life and preserve the environment. However, the rise of technology in social and health policy has often sidelined this knowledge, treating it as an auxiliary rather than an essential. Initiatives led by engineers have pressured indigenous communities to adapt to engineering frameworks, allowing technology to dictate what knowledge is prioritized. This shows a need to reevaluate how indigenous knowledge fits into health engineering. Understanding why it has been overlooked is essential. The development of automatic knowledge systems largely emerged in societies with advanced recording capabilities and scientific standards, while indigenous cultures do not always rely on these methods and have their powerful oral traditions managed by “wisdom speakers." This raises questions about how effective recording and dissemination systems can reciprocate knowledge exchange with indigenous peoples. Furthermore, there is a lack of knowledge engineering focused on creating synergies between indigenous and scientific methods. Indigenous communities have adeptly adopted tech innovations for new needs, potentially due to innate capacities, yet health engineering education often neglects practical systems that engage them. This oversight risks excluding many communities from social and health disciplines. To address this, new approaches championing simplicity, accessibility, and solution-oriented designs must be developed, enabling knowledge processing even in resource-limited environments. Additionally, emerging health technologies should respect concerns over who controls indigenous knowledge dissemination [9, 10].

Ethical Considerations

The integration of Indigenous Knowledge into Modern Health Engineering presents various legal and ethical challenges across continents. These issues focus on the sharing, retention, and use of Indigenous Knowledge concerning health and wellness systems. An ethical approach is essential to balance different knowledge systems while addressing the legal protection of Indigenous Knowledge within complex compliance frameworks. Additionally, the lesser consideration of Indigenous rights and international charters may aid in mainstreaming Indigenous Knowledge. It is crucial to examine biopiracy and the ownership of knowledge derived from Indigenous sources, as the appropriation of Indigenous Knowledge in health engineering may occur unnoticed. Ethical considerations regarding the use, access, and sharing rights must be established in advance to address concerns surrounding these practices. The proposed Indigenous Knowledge Ethical Behaviour model aims to ensure accountability among all members of the Investigatory Cohort regarding ethical conduct. This model highlights the need to respect the unique legal and ethical implications tied to the access and production of Indigenous Knowledge, as these practices represent a transformative Intellectual Property process. The initial legal considerations should prioritize Indigenous Knowledge, establishing protocols that limit usage to specified purposes while ensuring complete description and crediting of Indigenous Knowledge in result-sharing arrangements [11, 12].

Collaborative Approaches

Considerations for ethical, collaborative partnerships are discussed in this section. Partnerships between Indigenous communities and researchers must be collaborative and symbiotic. Researchers’ agendas must align and not conflict with those of the Indigenous communities. Indigenous people must take considerable ownership of the research, provided access to raw data, and allowed access to research documentation to ensure findings and messages remain participatory and representational. Engagement must be ongoing, two-way and iterative. While Indigenous people are often engaged at the beginning, the analysis phase is conducted behind closed doors, engendering feelings of abandonment. Huge power imbalances exist between western researchers and Indigenous communities. Generally, Indigenous peoples do not regard research as internationally valid knowledge-making. Researchers must take care to be explicit about the kinds of knowledge deemed to be each stakeholder’s most valid pathways to engage in the co-production of solutions to sustainability. It is vital to communicate to designers and managers of the sustainability intervention that inadvertent biases regarding the presentation of their research results may occur in the analyses phase. Greater depth and breadth of understanding of diverse worldviews will result from effortfully undertaking to listen to either side’s perceptions of integrity and knowledge validity. This understanding engenders collective learning about potentially emergent wholly or partly novel pathways to learning. Conflicts may arise when Indigenous knowledge or policy ideas differ from those held by researchers. In these contexts, research must seek to unpack how sustainability is conceptualized. Researchers must take time to ensure a consistent understanding of what meanings shared goals and values may have. Researchers must also remain aware of their biases and values, which

have been conditioned by their education and life experiences. A broad conceptualization of sustainability not being made explicit may allow colonization to occur in the co-producing process or make the knowledge considered legitimate excessively narrow. Researchers need to sense this at the co-designing stage. Teams need to have ongoing discussions about how spirituality, materiality, and technology interact and relate to sustainable natural resource management [13, 14].

Policy Implications

Health problems are common across both indigenous communities and modern societies, affecting individuals despite access to advanced healthcare facilities. Various traditional populations, including those in America, Kenya, and Uganda, have suffered and died from diseases like smallpox and measles, often without success from traditional medicines and colonial health interventions. These issues merit documentation and sharing with industrialized societies to highlight the risks associated with an overly modern lifestyle that leads to increased vulnerability to diseases. Traditional diets and health practices offer a means to enjoy life while minimizing illness. To encourage indigenous communities to maintain their health traditions, it is crucial to document their extensive knowledge, beliefs, and rituals that govern healthcare. Observations show indigenous peoples actively seek special milk from cows and wild animals, showcasing their unique methods to manage and prevent diseases, especially where modern healthcare has failed. Therefore, policymakers are urged to recognize and incentivize indigenous health practices and knowledge systems. Additionally, understanding the challenges faced by these communities and the tools for investigating these issues is essential for effective collaboration. The diverse knowledge systems and rituals guiding disease management should be clarified, along with the ways this information is shared culturally through narratives and the implications of gender in health storytelling. Factors influencing the effectiveness of traditional health practices have also been addressed [15, 16].

Future Directions

The rise of narratives on self-determination and de-colonization provides a chance to understand health solutions guided by Indigenous peoples. The wisdom of First Nation, Inuit, and Métis communities offers insights that need to be shared widely. Celebrating Indigenous resilience and creativity can promote health models that shift focus from deficits. Research in this area challenges pessimism and explores public health solutions beyond state policies or biomedical agendas. Indigenous knowledge is vital for addressing sustainability and empowering communities, adapting to local contexts, and maintaining cultural identity. Examples like Traditional Ecological Knowledge (TEK) Networks illustrate the integration of Indigenous knowledge in resource management. Engaging with shared narratives reveals complexities and encourages collaboration. Documenting current practices helps advocate for future contributions to understanding these complexities. Just as past narratives can reshape views on healthy communities, future visions should be publicly recorded. Collaborative logic building is essential to support actions aimed at creating desirable futures and avoiding negative outcomes. Identifying key activities and present choices can inspire effective models for action. Exploring conditions and processes for change and their associated costs is crucial for fostering desirable transformations [17, 18].

Case Studies of Successful Integration

Integration of traditional indigenous medicine into health services is increasingly accepted globally. Communities with higher levels of indigenous development tend to establish their own health services based on traditional practices, even as Western medicine is often imposed. Many individuals navigate between these two systems with a mix of comfort and uncertainty. This intersection highlights an awareness of each system's offerings but lacks mutual respect, recognition, and flexibility. Intercultural health practices aim to bridge these medical systems and restore rights taken from indigenous peoples. Central to this effort is establishing reciprocal respect for each nation's health practices, necessitating adaptations aligned with local political, cultural, and geographical contexts. Despite the challenges, there are common approaches that can be shared at various levels, from family to the entire health system. Best practice initiatives in health care should positively impact defined populations, especially disadvantaged ones, and be sustainable. They must also cater to the cultural needs of the population, prioritizing client-focused care. Access to health care is crucial in addressing health inequalities; thus, health practices should enhance access to a broader range of services. In many rural and indigenous communities, where resources are limited, innovative coordination among services is vital. Lastly, best practice health services should allow for evaluation to ensure effectiveness [19, 20].

Impact on Community Health Outcomes

Government priorities in the public health sector are increasingly focused on improving health outcomes in Indigenous communities. Indigenous communities cannot be expected to deliver the health services their members want and need if those services aren't relevant to their worldview or cultural practices.

Much Indigenous health research has co-opted the rhetoric of empowerment, even while researchers charter the research and control access to the results. The process of transferring responsibility for health services to Indigenous organizations does not pledge the financial or human resources necessary for successfully assuming those responsibilities. Empowerment has overlapped with corporate-sector discourse, disclosing no alternatives to restructuring. Change in public health starts with finding alternatives to commodification that accommodate Aboriginal questions of survival and appropriate technology. A millennium of globalization has attempted to erase indigenous knowledges, languages, earth and sky, medicines, relationships, economies and governance systems. The economic, social, cultural and environmental conditions required for the survival and viability of Indigenous peoples should be paramount in any multi-level or international intervention. As a consequence of the ecological violence and systematic exclusion of Aboriginal people from the socio-economic, cultural and political development of the Sunshine Coast region, the new health and well-being problems not shared by other populations have emerged. These include excessive alcohol and drug abuse leading to violence and crime, mental disorders, suicide and early mortality, family disintegration and commercial sexual exploitation. Aboriginal people in Sydney's south-eastern suburbs experience some of the worst health and well-being outcomes of any population in Australia, and these conditions are well documented. Indigenous disadvantage also generates an array of economic and social inequities and environmental distress spilling over into neighbouring regions, which affects other populations [21, 22].

Education and Training

Education and training are crucial in the process of incorporating indigenous knowledge and its sacredness into modern health engineering. Institutions of higher learning must establish programs or departments dedicated to teaching indigenous knowledge. Success stories of integrating indigenous knowledge into health engineering should be documented and published to inspire academic institutions worldwide to adopt similar curricula. Financing indigenous health engineering researchers, authors willing to write indigenous knowledge narratives and documentaries will facilitate the process of fitting indigenous knowledge and its sacredness into health engineering. Existing technical texts that describe various forms of indigenous knowledge, particularly in health engineering, should be meticulously redesigned to account for the spirituality of a locality and aid in the understanding of the process of indigenous knowledge integration into health engineering. Universities should be extended to rural locations where indigenous communities can access the education that suits their cosmologies. Thus, traditional developments in health engineering should be taught using concepts like "God," "Mother Earth," "spirit beings," and other related ideas, instead of Western concepts like "environment," which may not be understood by indigenous communities. In a nutshell, education and training will help fill the current knowledge gap and serve as a blueprint for fitting indigenous knowledge and its sacredness into modern health engineering in a way that is understood throughout the world [23, 24].

Technology Transfer and Knowledge Sharing

There are additional methods for technology transfer and knowledge sharing that go beyond traditional intending contexts, other than indigenous to indigenous, non-indigenous to indigenous, and mixed approaches. Those include action research through participatory engagement and co-designing of knowledge organization tools, and general participatory approaches to facilitate local, national, regional, and international networks and collectives to identify, share, savour, and advocate indigenous knowledges and practices. Other projects and initiatives analysed from this perspective may offer more entries for the comparative approach proposed and for further studies. There are already remarkable examples of how to embrace indigenous knowledge in building systems for wider knowledge sharing, joint sense making of past experiences, and advocacy by indigenous communities. Just to name a few, the One Village One Product network, the Dubai–Heiligenthal approach to Community of Practice (CoP), the co-research experience between journalists and indigenous civic society actors in Central and South America, and te Wahu and Catemaco initiatives of indigenous activists in New Zealand and Central Mexico. How to overcome more direct influence and imposition of more fiery forms of action research and learning on traditional knowledges is a challenge for users and designers alike of these knowledge organization tools in indigenous realms. Less prescriptive and more accommodating forms of external technology design, which feed off local activist contexts rather than wanting to pre-empt or substitute them, should be explored and promoted. Hence the focus of current literature on specific kindred initiatives in Africa. The proposed focus on endogenous cultural ecologies in design research and development may complement these analyses of pre-existing knowledge organization tools and of endogenous processes wishing to capture indigenous knowledges into internet system [25, 26].

Barriers to Integration

Many integration projects struggle despite promises of mutual respect and knowledge sharing. This chapter examines two case studies of Indigenous non-state actors in health engineering, focusing on the challenges of integrating Indigenous Knowledge (IK) with economic modeling. Researchers increasingly seek to incorporate IK into decision-making, but the process requires culturally appropriate approaches developed through partnerships with Indigenous communities. Sharing these insights with non-Indigenous partners is essential, yet understanding the limits of integration is crucial. This analysis highlights instances of failed integration in health engineering projects, emphasizing that scenarios must be tailored to the local social and political contexts and the specifics of IK systems and models. Key partnership principles, such as mutual respect and commitment to engagement, are important; however, little attention has been paid to the limits of integration or to projects that fell short of expectations. The analysis of two integration cases reveals barriers previously overlooked. First, a partnership with the OECD illustrates how complex health agenda-setting models hindered IK integration. Second, a case from the Inuit Nunangat shows how colonial legislative contexts obstructed co-designed knowledge sharing, revealing conflicting worldviews between modern and Indigenous knowledge systems. These in-depth analyses provide valuable insights for research on IK integration in socio-technical processes [27, 28].

CONCLUSION

Indigenous Knowledge holds transformative potential in reimagining modern health engineering moving it beyond narrow biomedical confines toward more holistic, sustainable, and culturally attuned frameworks. Far from being antiquated or incompatible, Indigenous health practices offer adaptive, tested strategies for disease prevention, ecological management, and community resilience. However, their successful integration requires respect for epistemological differences, legal protections against exploitation, and inclusive policy mechanisms. Effective collaboration between Indigenous communities, researchers, and health engineers must center equity, shared ownership, and mutual learning. Future pathways must be co-designed through dialogue, documentation, and innovation that honors both ancestral wisdom and modern technology. In an era grappling with climate change, pandemics, and health inequities, blending Indigenous Knowledge with modern health engineering is not merely desirable—it is imperative for the wellbeing of both people and the planet.

REFERENCES

1. Fernández-Llamazares Á, Lepofsky D, Lertzman K, Armstrong CG, Brondizio ES, Gavin MC, Lyver PO, Nicholas GP, Pascua PA, Reo NJ, Reyes-García V. Scientists' warning to humanity on threats to indigenous and local knowledge systems. Journal of Ethnobiology. 2021 Jul;41(2):144-69. sagepub.com
2. Dawson NM, Coolsaet B, Sterling EJ, Loveridge R, Gross-Camp ND, Wongbusarakum S, Sangha KK, Scherl LM, Phan HP, Zafra-Calvo N, Lavey WG. The role of Indigenous peoples and local communities in effective and equitable conservation. Ecology and society. 2021;26(3):19. cdu.edu.au
3. Bihari S. Cultural heritage and indigenous knowledge: Reviving traditions for future generations. Sustainable Development Goals in SAARC Countries: Key Issues, Opportunities and Challenges. 2023 Jun;1:24-32. researchgate.net
4. Okere T, Njoku CA, Devisch R. All knowledge is first of all local knowledge: An introduction. Africa Development. 2005 Dec 15;30(3).
5. Brownson SU, Chigbu G, Osazuwa CM. Cultural security and environmental conservation: Exploring the link between indigenous knowledge systems and sustainable resource management in cross rivers state. The American Journal of Management and Economics Innovations. 2024 Aug 14;6(08):13-40. inlibrary.uz
6. Estrada A, Garber PA, Gouveia S, Fernández-Llamazares Á, Ascensão F, Fuentes A, Garnett ST, Shaffer C, Bicca-Marques J, Fa JE, Hockings K. Global importance of Indigenous Peoples, their lands, and knowledge systems for saving the world's primates from extinction. Science advances. 2022 Aug 10;8(31):eabn2927. science.org
7. Kulkov I, Tsvetkova A, Ivanova-Gongne M. Identifying institutional barriers when implementing new technologies in the healthcare industry. European Journal of Innovation Management. 2023 Jun 8;26(4):909-32. abo.fi
8. Coque TM, Cantón R, Pérez-Cobas AE, Fernández-de-Bobadilla MD, Baquero F. Antimicrobial resistance in the global health network: known unknowns and challenges for efficient responses in the 21st century. Microorganisms. 2023 Apr 17;11(4):1050. mdpi.com

9. Panda GK, Chatterjee U, Panda S. Indigenous knowledge and disaster risk reduction: insight toward perception, response, adaptation and sustainability. InIndigenous Knowledge and Disaster Risk Reduction: Insight Towards Perception, Response, Adaptation and Sustainability 2023 May 4 (pp. 3-18). Cham: Springer International Publishing.
10. Faye SL, Nkweteyim D, Sow GH, Diop B, Diongue FB, Cisse B, Dickson N, Dia N, Badu K, Ayana G, Ba ML. Reimagining Artificial Intelligence for zoonotic disease detection in Africa: a decolonial approach rooted in community engagement and local knowledge. AI and Ethics. 2025 Jun 28:1-28. [HTML]
11. da Silva RG. The advancement of artificial intelligence in biomedical research and health innovation: challenges and opportunities in emerging economies. Globalization and health. 2024 May 21;20(1):44.
12. Ayinla BS, Amoo OO, Atadoga A, Abrahams TO, Osasona F, Farayola OA. Ethical AI in practice: Balancing technological advancements with human values. International Journal of Science and Research Archive. 2024 Feb;11(1):1311-26. researchgate.net
13. Abimbola S, van de Kamp J, Lariat J, Rathod L, Klipstein-Grobusch K, van der Graaf R, Bhakuni H. Unfair knowledge practices in global health: a realist synthesis. Health policy and planning. 2024 Jul 1;39(6):636-50. oup.com
14. Perera M, Vidanaarachchi R, Chandrashekeran S, Kennedy M, Kennedy B, Halgamuge S. Indigenous peoples and artificial intelligence: A systematic review and future directions. Big Data & Society. 2025 Jun;12(2):20539517251349170. sagepub.com
15. Chikati D. Influence of indigenous education to traditional methods of disease prevention and management as practiced by the Bukusu community of Kenya. International Journal of Sciences: Basic and Applied Research. 2016;25(1):1-6.
16. Negi VS, Pathak R, Thakur S, Joshi RK, Bhatt ID, Rawal RS. Scoping the need of mainstreaming indigenous knowledge for sustainable use of bioresources in the Indian Himalayan region. Environmental Management. 2023 Jul;72(1):135-46.
17. Watego C, Whop LJ, Singh D, Mukandi B, Macoun A, Newhouse G, Drummond A, McQuire A, Stajic J, Kajlich H, Brough M. Black to the future: Making the case for indigenist health humanities. International journal of environmental research and public health. 2021 Aug 18;18(16):8704.
18. Parsons M, Nalau J, Fisher K. Alternative perspectives on sustainability: Indigenous knowledge and methodologies. Challenges in Sustainability. 2017;5(1):7-14.
19. Brondízio ES, Aumeeruddy-Thomas Y, Bates P, Carino J, Fernández-Llamazares Á, Ferrari MF, Galvin K, Reyes-García V, McElwee P, Molnár Z, Samakov A. Locally based, regionally manifested, and globally relevant: Indigenous and local knowledge, values, and practices for nature. Annual Review of Environment and Resources. 2021 Oct 17;46(1):481-509. annualreviews.org
20. Redvers N, Aubrey P, Celidwen Y, Hill K. Indigenous Peoples: Traditional knowledges, climate change, and health. PLOS global public health. 2023 Oct 13;3(10):e0002474. plos.org
21. Kaphle S, Fanany R, Kelly J, Rawal L, Paudel G. Living at the Fence–Navigating Complexities While Settling in New Country: Lived Experiences of South Sudanese Refugees in Australia. Journal of Intercultural Studies. 2024 Jul 3;45(4):689-705.
22. McManus P. A more-than-urban political ecology of bushfire smoke in eastern Australia, 2019–2020. Australian Geographer. 2021 Jul 3;52(3):243-56.
23. Mbah M, Ajaps S, Molthan-Hill P. A systematic review of the deployment of indigenous knowledge systems towards climate change adaptation in developing world contexts: implications for climate change education. Sustainability. 2021 Apr 25;13(9):4811.
24. Jayatilake SM, Ganegoda GU. Involvement of machine learning tools in healthcare decision making. Journal of healthcare engineering. 2021;2021(1):6679512. wiley.com
25. Tucker R, Andrews F, Johnson L, Palmer J. Architects' professional perspectives on child-and family-friendly apartment design in Australia. Journal of Asian Architecture and Building Engineering. 2022 Nov 2;21(6):2262-76. tandfonline.com
26. Salave S, Patel P, Desai N, Rana D, Benival D, Khunt D, Thanawuth K, Prajapati BG, Sriamornsak P. Recent advances in dosage form design for the elderly: a review. Expert opinion on drug delivery. 2023 Nov 2;20(11):1553-71. [HTML]
27. Utter A, White A, Méndez VE, Morris K. Co-creation of knowledge in agroecology. Elem Sci Anth. 2021 Nov 3;9(1):00026.

28. Ruano-Chamorro C, Gurney GG, Cinner JE. Advancing procedural justice in conservation. Conservation Letters. 2022 May;15(3):e12861. wiley.com

CITE AS: Awafung Emmanuel (2025). Indigenous Knowledge in Modern Health Engineering. EURASIAN EXPERIMENT JOURNAL OF ENGINEERING, 5(2):30-37