

*Artificial Intelligence Governance for Posterity: Utilising Small Language Models (SLMs) and
Community Data to Revitalize Indigenous Knowledge*

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**Artificial Intelligence Governance for Posterity: Utilising Small Language Models (SLMs),
and Community Data to Revitalize Indigenous Knowledge**

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Abstract

This paper interrogates how AI can be effectively governed by utilising Small Language Models (SLMs) and community data to revitalize indigenous knowledge. The paper observes that the intersection of AI and indigenous knowledge is a double-edged sword with both benefits and challenges. In particular, the paper notes that AI provides opportunities to harness indigenous knowledge towards bolstering education, healthcare and agriculture, among other key sectors for development. On the other hand, the paper notes that AI can violate indigenous knowledge through algorithmic biases, digital colonialism and breach of indigenous data sovereignty. In light of the foregoing, the paper argues that it is imperative to rethink the relationship between AI and indigenous knowledge for development. In order to achieve this ideal, the paper suggests how SLMs and community data can be utilised to revitalize indigenous knowledge towards appropriate AI governance for posterity.

1.0 Introduction

Artificial Intelligence (AI) governance is key towards harnessing the transformative potential of this powerful technology for development while minimising its risks, challenges and ethical concerns. It has been observed that AI governance relies on the ability of state and non-state actors to set common universal standards on technological risks, the boundaries to be drawn, and the principles to be safeguarded when developing and adopting AI¹. AI governance is a framework that covers processes, standards and regulations designed to ensure that AI tools and systems are safe, appropriate and ethical². The purpose of AI governance is to direct AI research, development and application to help ensure safety, ethics, justice, fairness and respect for human rights³.

The transformative power of AI is key towards achieving the ambitious targets of the 2030 Agenda for Sustainable Development. For example, AI is revolutionizing education, transportation, finance, data storage, communications, healthcare, environmental governance and law enforcement providing numerous opportunities to unlock Sustainable Development⁴. However, despite its transformative potential, AI can raise profound risks and challenges since it can embed and worsen biases, fuel socio-economic inequalities, violate human rights and undermine sustainability⁵. In particular, risks and challenges including algorithmic biases, inadequate transparency and accountability safeguards, digital colonialism and the digital divide

¹ French Institute of International Relations., 'Artificial Promises or Real Regulation? Inventing Global AI Governance' Available at <https://www.ifri.org/en/studies/artificial-promises-or-real-regulation-inventing-global-ai-governance> (Accessed on 14/07/2026)

² What is AI Governance?., Available at <https://www.ibm.com/think/topics/ai-governance> (Accessed on 14/07/2026)

³ Ibid

⁴ Organisation for Economic Co-operation and Development., 'Governing with Artificial Intelligence' Available at https://www.oecd.org/en/publications/2025/06/governing-with-artificial-intelligence_398fa287.html (Accessed on 14/07/2026)

⁵ United Nations Educational, Scientific and Cultural Organization., 'Ethics of Artificial Intelligence' Available at <https://www.unesco.org/en/artificial-intelligence/recommendation-ethics> (Accessed on 14/07/2026)

undermine the safe, appropriate, ethical, transparent and accountable development and adoption of AI⁶.

In light of the foregoing concerns, appropriate governance is crucial towards harnessing the benefits of AI for development while tackling risks and challenges. It has been observed that through sound governance, it is possible to shape AI's impact on society by addressing its social implications, ensuring transparency and accountability, promoting human rights and fostering responsible innovation⁷.

This paper interrogates how AI can be effectively governed by utilising Small Language Models (SLMs) and community data to revitalize indigenous knowledge. The paper observes that the intersection of AI and indigenous knowledge is a double-edged sword with both benefits and challenges. In particular, the paper notes that AI provides opportunities to harness indigenous knowledge towards bolstering education, healthcare and agriculture, among other key sectors for development. On the other hand, the paper notes that AI can violate indigenous knowledge through algorithmic biases, digital colonialism and breach of indigenous data sovereignty. In light of the foregoing, the paper argues that it is imperative to rethink the relationship between AI and indigenous knowledge for development. In order to achieve this ideal, the paper suggests how SLMs and community data can be utilised to revitalize indigenous knowledge towards appropriate AI governance for posterity.

2.0 The Intersection of Artificial Intelligence and Indigenous Knowledge

Indigenous knowledge refers to the understanding, wisdom and practices developed by indigenous and local communities over generations, rooted in their unique cultural experiences and relationships with the natural environment⁸. Indigenous knowledge has also been defined as the understandings, skills, practices and philosophies developed by societies with long histories of interaction with their natural surroundings⁹. Indigenous knowledge is a rich body of knowledge that supports the livelihoods, health, well-being and development of indigenous peoples and local communities. This knowledge is usually applied in sustainable resource management, agriculture, traditional medicine, biodiversity conservation and climate action thus enabling indigenous and local communities to live sustainably and in harmony with nature towards Sustainable Development¹⁰.

⁶ Organisation for Economic Co-operation and Development., 'Governing with Artificial Intelligence' Op Cit

⁷ United Nations Educational, Scientific and Cultural Organization., 'AI Governance' Available at <https://www.unesco.org/en/query-list/a/ai-governance#term-definition> (Accessed on 14/07/2026)

⁸ United Nations Educational, Scientific and Cultural Organization., 'Indigenous Knowledge' Available at <https://www.unesco.org/en/query-list/i/indigenous-knowledge> (Accessed on 14/07/2026)

⁹ What Does Indigenous Knowledge Mean? A Compilation of Attributes., Available at <https://www.ictinc.ca/blog/what-does-indigenous-knowledge-mean> (Accessed on 14/07/2026)

¹⁰ United Nations Educational, Scientific and Cultural Organization., 'Indigenous Knowledge' Op Cit

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The emergence of AI provides opportunities to harness indigenous knowledge towards Sustainable Development. For instance, the United Nations points out that when developed inclusively, ethically and responsibly, AI can support revitalization of indigenous languages and enhance cultural preservation¹¹. In particular, AI-driven tools and systems can help document endangered indigenous languages, contributing to their revitalization and preservation for future generations¹².

In addition, AI provides tools and systems that can be used to harness indigenous data sets towards Sustainable Development. Indigenous peoples and local communities, especially in the Global South, have developed unique knowledge systems on key aspects such as traditional medicine, sustainable agricultural practices, ecosystem management, biodiversity conservation, and climate action¹³. Consequently, by blending indigenous knowledge and AI, it is possible to build unique and rich data sets that reflect cultural, ethical, environmental and linguistic needs in the Global South¹⁴.

Despite its role in revitalizing indigenous knowledge, AI poses several risks and challenges that can undermine this rich body of knowledge. For instance, it has been observed that AI can fuel the erosion of indigenous and cultural knowledge¹⁵. In particular, it has been pointed out that biased AI data sets can perpetuate harmful stereotypes against indigenous knowledge systems risking their erosion¹⁶. AI tools and systems used in healthcare, education and agriculture often fuel biases and discrimination against indigenous knowledge systems in the Global South undermining their growth¹⁷. AI can also lead to data-grabbing that fails to respect the principle

¹¹ United Nations., 'Ensuring Indigenous Peoples' rights in the age of AI' Available at <https://www.un.org/en/desa/ensuring-indigenous-peoples%E2%80%99rights-age-ai> (Accessed on 14/07/2026)

¹² Ibid

¹³ International Labour Organization., 'Sustainable Development Goals: Indigenous Peoples in Focus' Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/@ifp_skills/documents/publication/wcms_503715.pdf (Accessed on 14/07/2026)

¹⁴ African-language Large Language Models (LLMs) present major opportunities for the continent., Available at <https://medium.com/code-for-africa/african-language-large-language-models-llms-present-major-opportunities-for-the-continent-8a92a69518b3> (Accessed on 14/07/2026)

¹⁵ Perera. M et al., 'Indigenous peoples and artificial intelligence: A systematic review and future directions' Available at <https://journals.sagepub.com/doi/10.1177/20539517251349170#:~:text=Abstract,Discuss%20Literature%20under%20each%20category> (Accessed on 14/06/2026)

¹⁶ Indigenous Knowledge Systems and AI., Available at <https://link.springer.com/collections/hjehacfe> (Accessed on 14/07/2026)

¹⁷ How to Break Digital Colonialism in African Software Development., Available at <https://www.ictworks.org/digital-colonialism-african-software-development/#:~:text=Defining%20Digital%20Colonialism%20in%20Software,serve%20its%20communities%20best%20interests> (Accessed on 14/07/2026)

of indigenous data sovereignty¹⁸. It has been observed that AI tools have been used to extract and commodify indigenous knowledge in areas such as agriculture, healthcare and environmental governance without proper consent and collaboration from the knowledge holders thus undermining indigenous data sovereignty¹⁹.

In light of the foregoing concerns, sound and effective AI governance is key towards revitalizing indigenous knowledge for sustainability. The United Nations correctly notes that without adequate and effective safeguards put in place, AI can reinforce harmful biases, discrimination and exclusion, and lead to the appropriation of the culture and knowledge of indigenous and local communities without their consent²⁰.

3.0 Utilising Small Language Models (SLMs) and Community Data to Revitalize Indigenous Knowledge

With AI revolutionizing governance processes, it is imperative to harness the wisdom of indigenous and local communities in order to foster progress towards Sustainable Development. With the right policies and frameworks, AI can be utilised to preserve indigenous culture and languages and utilise indigenous data sets in education, healthcare, agriculture and environmental governance towards sustainability²¹. However, AI is also undermining indigenous knowledge through algorithmic biases, digital colonialism and breach of indigenous data sovereignty²². Consequently, there is need for sound governance frameworks in order to ensure that AI is utilised to revamp rather than undermine indigenous knowledge.

SLMs are appropriate AI-tools that can be utilised to revitalize indigenous knowledge. SLMs have been defined as AI models capable of processing, understanding and generating natural language content²³. It has been observed that SLMs are a subset of language models capable to perform specific tasks by utilising fewer resources when compared to Large Language Models (LLMs)²⁴. SLMs are simple in their structure and architecture thus allowing for faster training, use on devices with limited resources, and reduced energy consumption²⁵. In addition, it has been observed that SLMs are trained on more specialized knowledge unlike LLMs which are trained

¹⁸ Perera. M et al., 'Indigenous peoples and artificial intelligence: A systematic review and future directions' Op Cit

¹⁹ Indigenous Knowledge Systems and AI., Op Cit

²⁰ United Nations., 'Ensuring Indigenous Peoples' rights in the age of AI' Op Cit

²¹ African-language Large Language Models (LLMs) present major opportunities for the continent., Op Cit

²² United Nations., 'Ensuring Indigenous Peoples' rights in the age of AI' Op Cit

²³ What are Small Language Models?., Available at <https://www.ibm.com/think/topics/small-language-models> (Accessed on 14/07/2026)

²⁴ What are Small Language Models (SLMs?)., Available at <https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-are-small-language-models> (Accessed on 14/07/2026)

²⁵ Ibid

on broad general knowledge²⁶. These models also require fewer resources for training and deployment thus reducing infrastructure costs²⁷.

Due to their advantages, SLMs have been described as an efficient, faster and greener approach towards AI²⁸. For example, harnessing LLMs requires substantial energy and infrastructure resources raising sustainability concerns²⁹. On the other hand SLMs are easy to deploy, require limited infrastructure and have a limited energy demand providing a viable option towards sustainability³⁰. Further, since SLMs are trained on smaller data sets which are tailored to specific industries, they can be effectively applied to boost governance processes in specific sectors including healthcare and education³¹.

In particular, it has been observed that access to SLMs is key in the Global South where countries struggle with limited digital infrastructure and resources³². For instance, their limited resource requirements can effectively bridge the digital divide in the Global South towards fast-tracking the adoption of AI for development³³. Further, it has been observed that SLMs provide a suitable approach that can enable developing countries to build home-grown AI tools that leverage on local datasets³⁴. In addition, it has been argued that since LLMs are tailored and heavily reliant on languages and data sets from the Global North, SLMs are more appropriate towards allowing indigenous and local communities in the Global South to own their data sets and preserve their indigenous languages³⁵. Since these models are tailored to specific sectors, they can be fine-tuned on indigenous data sets including traditional medicine and healing practices, agroforestry, biodiversity conservation, climate-resilient farming, ecosystem management and sustainable water management towards revitalizing indigenous knowledge for sustainability³⁶.

SLMs are therefore a suitable approach towards bolstering AI governance for sustainability. It has been observed that for Africa and the Global South, SLMs are a practical entry point since

²⁶ SLMs vs LLMs: What are small language models?., Available at <https://www.redhat.com/en/topics/ai/llm-vs-slm> (Accessed on 14/07/2026)

²⁷ Ibid

²⁸ United Nations Educational, Scientific and Cultural Organization., 'Small language models (SLMs): A cheaper, greener route into AI' Available at <https://www.unesco.org/en/articles/small-language-models-slms-cheaper-greener-route-ai> (Accessed on 14/07/2026)

²⁹ Ibid

³⁰ Ibid

³¹ SLMs vs LLMs: What are small language models?., Op Cit

³² United Nations Educational, Scientific and Cultural Organization., 'Small language models (SLMs): A cheaper, greener route into AI' Op Cit

³³ Ibid

³⁴ Ibid

³⁵ Africa's AI Leap: Building SLMs for Impact Without Infrastructure Overhaul., Available at <https://africa.com/africas-ai-leap-building-slms-for-impact-without-infrastructure-overhaul> (Accessed on 14/07/2026)

³⁶ Ibid

they are sector-focused AI systems that can support the shift away from foreign and technical AI systems including LLMs, while addressing unique development challenges in agriculture, healthcare, finance, education, and environmental governance among others³⁷. SLMs can strengthen efforts to digitize and safeguard cultural heritage and preserve indigenous knowledge in the Global South for posterity³⁸.

Utilising SLMs is therefore a practical approach towards revitalizing indigenous knowledge for posterity. These models can be fine-tuned on indigenous and community data thus supporting cultural and language preservation for posterity³⁹. Consequently, countries in the Global South have been urged to leverage on SLMs in order to address the infrastructure and capacity challenges that undermine the effective adoption of AI⁴⁰. SLMs can facilitate the development and use of AI tools rooted in local expertise and community data including indigenous data sets towards building local and culturally-appropriate AI ecosystems that address the unique development needs in the Global South⁴¹.

Utilising SLMs is therefore a key approach towards harness community data to revitalize indigenous knowledge.

4.0 Conclusion

In light of its rapid development and deployment, appropriate AI governance is key towards harnessing its transformative potential while mitigating risks and challenges. In particular, the intersection of AI and indigenous knowledge requires effective governance in order to harness benefits such as cultural and language preservation and use of indigenous data sets in healthcare, education, agriculture and environmental governance, while tackling challenges such as algorithmic biases, digital colonialism and breach of indigenous data sovereignty⁴². SLMs provide a practical tool towards achieving this ideal by harnessing community data to support cultural preservation and use of indigenous knowledge in education, healthcare, agriculture, climate action and environmental governance among other sectors⁴³. Utilising SLMs and community data is therefore a viable and effective approach towards revitalizing indigenous knowledge in order to achieve sound AI governance for posterity.

³⁷ Africa's AI Leap: Building SLMs for Impact Without Infrastructure Overhaul., Available at <https://africa.com/africas-ai-leap-building-slms-for-impact-without-infrastructure-overhaul> (Accessed on 14/07/2026)

³⁸ Ibid

³⁹ Ibid

⁴⁰ United Nations Educational, Scientific and Cultural Organization., 'Small language models (SLMs): A cheaper, greener route into AI' Op Cit

⁴¹ Ibid

⁴² Perera. M et al., 'Indigenous peoples and artificial intelligence: A systematic review and future directions' Op Cit

⁴³ United Nations Educational, Scientific and Cultural Organization., 'Small language models (SLMs): A cheaper, greener route into AI' Op Cit

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