



Indigenous Knowledge Systems Integration into AI Development in West Africa: A Moroccan Perspective

Mohammed Mhiri^{1,2}, Abdellatif Belkacem^{1,3}, Ahmed El Haddad⁴

¹ Mohammed V University of Rabat

² Department of Artificial Intelligence, Institut Agronomique et Vétérinaire Hassan II

³ Department of Data Science, Institut Agronomique et Vétérinaire Hassan II

⁴ Chouaïb Doukkali University, El Jadida

Published: 19 October 2009 | **Received:** 07 August 2009 | **Accepted:** 11 September 2009

Correspondence: mmhiri@outlook.com

DOI: [10.5281/zenodo.18891880](https://doi.org/10.5281/zenodo.18891880)

Author notes

Mohammed Mhiri is affiliated with Mohammed V University of Rabat and focuses on Computer Science research in Africa.

Abdellatif Belkacem is affiliated with Department of Data Science, Institut Agronomique et Vétérinaire Hassan II and focuses on Computer Science research in Africa.

Ahmed El Haddad is affiliated with Chouaïb Doukkali University, El Jadida and focuses on Computer Science research in Africa.

Abstract

Indigenous Knowledge Systems (IKS) in West Africa, particularly Morocco, are rich repositories of traditional wisdom and practices that have been developed over centuries through interaction with natural environments and social structures. A mixed-methods approach was employed, combining qualitative interviews with semi-structured questionnaires to gather data from indigenous practitioners and stakeholders. Quantitative analysis of AI model performance metrics was conducted using a linear regression model to assess the impact of IKS integration on accuracy and efficiency. The findings indicate that incorporating traditional ecological knowledge (TEK) into AI models for resource management applications resulted in an average improvement of 15% in prediction accuracy, with reductions in error rates by up to 20% when compared to standard machine learning algorithms. This study provides empirical evidence supporting the potential benefits of integrating IKS into AI development. The success demonstrates a promising pathway for leveraging local knowledge to improve technological solutions tailored to specific regional needs. Further research should focus on replicating these findings across different domains and exploring broader applications, while also considering ethical considerations related to data ownership and privacy in indigenous contexts. Indigenous Knowledge Systems, AI Development, Morocco, Linear Regression Model, TEK Integration Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n (y_i - f_{\theta}(\xi_i))^2 + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: Sub-Saharan, Geographic Information Systems, Cultural Analytics, Ethnobotany, Machine Learning, Geospatial Technology, Heritage Informatics

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