



Integrating Indigenous Knowledge Systems into AI Development in West Africa: A Review

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Abstract

The integration of Indigenous Knowledge Systems (IKS) into Artificial Intelligence (AI) development in West Africa's Benin is an emerging field with significant potential for innovation and social impact. A comprehensive search strategy was employed across multiple databases including Web of Science, Scopus, and Google Scholar. Studies published from to were included, with a final sample size of 45 articles. Studies were assessed for quality using the Critical Appraisal Skills Programme (CASP) tool. The review identified a growing body of work on IKS-AI integration, particularly in health care and agriculture sectors. A key finding is that while there is increasing interest and some successful case studies, significant challenges remain regarding data privacy, cultural adaptation, and training for AI developers. Despite the preliminary nature of much of the research, this review highlights promising avenues for future work. It underscores the importance of fostering collaboration between technologists and traditional knowledge holders to ensure ethical and effective AI development in West African settings. Future research should prioritise methodological rigor, particularly in data collection methods that respect IKS principles. Practical guidelines should be developed to support AI developers in incorporating cultural considerations into their work. Model estimation used $\hat{\theta} = \operatorname{argmin} \{ \theta \} \sum_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2$, with performance evaluated using out-of-sample error.

Keywords: *African, AI, Indigenous Knowledge Systems, Methodology, West Africa, Technology Transfer, Cultural Studies*

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