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Editorial Commentary

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Introduction

With great excitement, I present the inaugural issue of the African Journal of Geophysics and Earth Sciences (AJGES). This journal was established to provide a premier platform for innovative, interdisciplinary research across geophysics, geology, climate science, hydrology, environmental geoscience, meteorology, oceanography, astronomy, and allied fields, with a special focus on Africa and the Global South. AJGES seeks to promote interdisciplinary discussion and evidence-based decision-making while advancing knowledge and influencing academic debate, policy, and practice.

The diverse range of original research, applied studies, and theoretical ideas in this inaugural issue demonstrates the continent's ability to provide solid, policy-relevant geoscience knowledge. It is helpful to think about the importance of environmental and geophysical research for Africa's sustainable development trajectory before summarizing the contents of this volume.

Context and Relevance

Groundwater scarcity, migration brought on by climate change, unsustainable mining methods, land degradation, and ecosystem fragility are just a few of Africa's complicated environmental and geophysical issues (Foster et al., 2013; Taylor et al., 2020). Comprehending these occurrences is essential for managing local resources and comparing geophysical processes on a regional and global scale.

Rapid urbanization, diverse rainfall patterns, and heterogeneous geology all affect the hydrological and geophysical dynamics of the continent. Thus, for well-informed decision-making, infrastructure development, and risk mitigation, research that combines geophysics, climate science, and environmental monitoring is crucial (Oki & Kanae, 2006; World Bank, 2016). The studies presented in this inaugural issue exemplify how rigorous geoscience research can inform sustainable policies and interventions tailored to Africa's diverse socio-environmental contexts.

Overview of Contributions

The first paper by Mjumphi, Qutieshat, and Kumari, titled "Growth and Sustainability of Artisanal and Small-Scale Gold Mining Cooperatives: A Case Study in Rufunsa District, Zambia," offers a thorough examination of artisanal and small-scale mining (ASM) cooperatives, emphasizing the interaction of operational, socioeconomic, and environmental factors that affect their sustainability. The authors look at how gender functions in these cooperatives and find differences in revenue distribution, decision-making responsibilities, and access to mining resources. Using both qualitative interviews and quantitative surveys, the study finds inadequacies in environmental stewardship, governance systems, and resource distribution. In addition to offering legal interventions to encourage cooperative expansion while preventing ecological damage, the study emphasizes the convergence of environmental, social, and governance (ESG) practices and offers significant suggestions for tailored governance changes. The findings underscore the critical need for policy frameworks that balance economic livelihoods with sustainable mining practices in Zambia and similar contexts across Africa.

The second article, "Exploring the Effects of Illegal Gold Mining Activities and Their Impact on the Environment: The Case of Kwe Kwe District, Zimbabwe," by Pande and Makonye, examines how informal mining methods endanger the environment and human health. Using

information from field visits, laboratory tests of soil and water, and resident surveys, the authors show that mercury and cyanide used in unlawful extraction cause significant soil degradation, water contamination, and health concerns. The study also emphasizes the socioeconomic elements that lead to these behaviors: unemployment, widespread poverty, and a lack of employment opportunities. To address these issues, the authors propose formalizing artisanal and small-scale mining, encouraging ecologically friendly mining practices, and implementing community-based education initiatives. The report makes practical recommendations for politicians, NGOs, and regulators seeking to limit ecological damage while protecting community well-being by positioning environmental consequences within larger governance and social settings.

The intricate relationships between climate change, rural-to-urban migration, and urban resilience are examined in the third paper by Were and Chaudhry, "Climate-Induced Migration and Key Challenges of Urban Adaptation in the IGAD Region: A Case Study of Nairobi City, Kenya." The authors demonstrate that climate-induced migration exacerbates urban stressors such as the growth of informal settlements, insufficient water and sanitation services, and energy insecurity through a mixed-methods approach that combines household surveys, key informant interviews, and GIS-based vulnerability mapping. The critical need for integrated urban planning, climate-resilient infrastructure, and inclusive policies that give disadvantaged communities priority is emphasized in the report. The report offers evidence-based suggestions for city planners, legislators, and development organizations throughout the IGAD region by connecting climate-induced migration to urban adaptation methods.

The fourth paper, "Groundwater Assessment of Uhonmora-Ora, Owan-West LGA, Edo State, Nigeria" by Agbebaku et al., builds on similar themes of water resource sustainability. The authors employ a combination of geospatial analysis, hydrological modeling, and field measurements to map groundwater flow, identify recharge and discharge zones, and determine aquifer vulnerability. Findings reveal significant spatial variability in groundwater availability, emphasizing the need for localized management strategies. The paper provides actionable recommendations for local government authorities, water resource managers, and community stakeholders to optimize borehole placement, enhance recharge, and implement conservation practices. By bridging

geophysical analysis with practical management, the study demonstrates the critical role of applied geoscience in achieving water security.

The fifth paper, “Geophysical Assessment of Groundwater Potential in the Nsukka Campus of University of Nigeria, Southeastern Nigeria, Using Vertical Electrical Sounding (VES)” by Ugbor et al., 2025 illustrates the practical application of geophysical methods in sustainable water resource management. Using Vertical Electrical Sounding techniques, the study delineates aquifer boundaries, assesses groundwater quality, and identifies potential recharge zones in hard rock terrains. The authors highlight the significance of integrating geophysical surveys with hydrogeological data to guide borehole siting, optimize groundwater extraction, and prevent overexploitation. The study also emphasizes the broader implications for regions facing water scarcity, demonstrating how geophysical research can inform policy and infrastructure planning while promoting long-term resource sustainability.

Together, these five contributions exemplify the depth, diversity, and applied relevance of geoscience research in Africa. They address pressing environmental and social challenges, offer concrete solutions for policy and resource management, and showcase the continent’s potential to generate high-quality, context-specific scientific knowledge. This inaugural issue of AJGES sets a high standard for rigorous interdisciplinary research and demonstrates the journal’s commitment to advancing sustainable development through geoscience.

Synthesis

These contributions demonstrate the breadth, depth, and importance of geoscience research in Africa. They address current environmental issues, provide concrete policy and managerial insights, and emphasize the necessity of interdisciplinary methods to understand complicated geophysical phenomena. This maiden issue benchmarks rigorous, impactful research and underscores AJGES’s mission to support knowledge-driven solutions across Africa and beyond.

Acknowledgements

I sincerely thank all authors, reviewers, and the editorial team for their dedication to producing this first issue—special thanks to the publisher for providing a platform to elevate African geoscience research. I also thank the broader scientific community whose prior work informed the studies presented here. To our readers and future contributors, your

engagement, insights, and scholarly contributions will be central to the continued growth and impact of AJGES.

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