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Editorial

Equitable Economic Development in Global South through Sustainable Mineral Policy: Role of Political and Governance Factors

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1. Introduction

The Global South has vast mineral reserves, which possess a distinct advantage for the region. They aid in rapid economic growth, but the continuous expansion of mineral wealth has led to environmental destruction, social turmoil and destabilization of government. It is a task to ensure that mineral extraction leads only to balanced, sustainable development rather than reinforcing unequal historical trajectories and causing environmental harm in the pursuit of national economic growth. Establishing policy and implementation mechanisms for sustainable utilization of minerals requires strong political will combined with effective governance (Koch and Burlyuk, 2020). Transparent, responsible and equitable governance, combined with policymaking, can ensure that revenues from resources are reinvested into diversifying the economy and developing social infrastructure.

Countries that have mineral wealth can be characterized by their excesses of money, corruption and environmental degradation; this phenomenon flows mainly from national governments but also individual groups. Sustainable mineral policies can hardly be put into practice because of political unrest and weak governance structures. South-South cooperation has provided a new

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play for the former North-South relationship only in respect of its success. These cooperative models are particularly attractive for developing inclusive policy directions that reflect the particular needs and aspirations of those affected communities (Yeung *et al*., 2019).

Energy and mineral exploration are necessary for the future of countries in the Global South. This understanding has underlined the importance of local community involvement in economic decision-making and the need for institutions controlled by people as an important component of equitable development. As these countries grapple with the complexities that globalization brings, it is essential that they re-position their administrative systems to suit new requirements (Bansal *et al*., 2024; Uwaoma and Eboigbe, 2023)

2. Contribution to the Issue

Effective governance and political frameworks are critical to ensuring that mineral wealth benefits everyone, reduces income gaps and promotes long-term industrialization. This is consistent with SDG 8 (Decent work and economic growth), which promotes equal economic opportunities; SDG 12 (Responsible consumption and production), which advocates for sustainable resource management; and SDG 16 (Peace, justice and strong institutions), which emphasizes transparency and good governance. Addressing these variables ensures that mineral policies benefit local communities while also promoting long-term sustainability. In this special issue, we publish research papers that examine the relationship between mineral resource governance, sustainability and equitable economic growth. The academics' contributions examine policy frameworks, regulatory systems and governance structures that influence resource management in the Global South.

Xuan *et al*. analyse the complicated relationship between mineral resources, the digital economy, sustainable economic development and other imperative factors in growing Global South economies, helping policymakers, businesses and stakeholders achieve equitable and sustainable growth. Secondly, the study aims to investigate the causes of digital adoption and its impact on inclusive development. Thus, the relationship between digital technology and economic growth is assessed. Thirdly, to evaluate governance structures and practices and assess their effectiveness in fostering openness, accountability and the rule of law, the study investigates how corruption control, government efficiency and regulation affect economic advancement and long-term growth. The study uses three governance indicators – corruption control, government effectiveness and regulatory quality – to explore how governance indicators promote innovation, entrepreneurship and inclusive growth in the Global South. The study uses advanced econometric methods to uncover new insights into this complex relationship using data from 1996 to 2022. The work uses rigorous panel data approaches such as moments quantile regression and parametric robustness checks such as cointegration regressions. The paper employs advanced econometric techniques to provide convincing policy implications to establish connections between mineral resources, the digital economy, governance and sustainable economic growth in the Global South.

The study's findings inform evidence-based initiatives for equitable growth, technological innovation and good governance by identifying sustainable economic development drivers. These strategies can improve economies by addressing socioeconomic challenges, increasing competitiveness and promoting long-term prosperity. Understanding the relationship between natural resources, the digital economy and government economic growth indicators can help businesses make informed investments, identify development opportunities and navigate regulations. This report suggests ways for firms to improve regional competitiveness and economic growth.

Liu *et al*. investigate the impact of Big Four audit firms on the environmental disclosure policies of publicly traded Chinese corporations. The study aims to shed light on how Big Four auditors influence corporate transparency and accountability in sustainability reporting. It examines how different corporate governance aspects influence this relationship. Also, it assesses how independent and female directors, institutional investors and state ownership influence company governance and ownership structure. The study uses annual data from 2012 to 2022 on A-listed shares in China and employs panel count models, such as Poisson and negative binomial, for analyses. The findings of the study indicate that the government should establish an independent environmental auditing organization to regulate and audit environmental disclosures, especially those conducted by Big Four businesses and state-owned enterprises (SOEs). To minimize potential conflicts of interest, this entity should not be associated with any existing audit firms. Increasing the representation of female and independent directors can also help achieve this goal. Mandatory female quotas should be implemented on public company boards, including incentives tax reductions, training and leadership initiatives. Additionally, key board committees, such as audit and risk committees, must be composed entirely or predominantly of independent directors. Independent directors should be empowered with greater authority to influence board decisions, especially ESG-related issues.

Baita *et al*. investigate the environmental effects of mining activities in countries within the Global South, specifically focusing on Brazil, China, India, Indonesia and Pakistan, from 1990 to 2020. The paper aims to close the gap between environmental regulations and the actual practices seen in the mining sector. The study identifies considerable variations in how key factors such as mineral rents, forest areas, GDP per capita and freshwater resources affect the ecological footprint. Additionally, this research aims to compare current environmental standards and managerial practices. According to the study, countries with higher incomes initially increase their ecological footprint but eventually lower it by adopting sustainable practices. This indicates that, while economic growth may initially hurt the environment, it might eventually lead to improvements. The link between economic activity and the environment is complex. These findings emphasize the importance of understanding the various elements that influence environmental regulations. To promote mining sustainability, each country requires solutions tailored to its demands. Policymakers should consider their country's distinct economic and environmental factors while developing policy. By balancing economic growth and environmental protection, mining companies can reduce negative impacts and encourage better resource management.

Zhao *et al*. examine the influence of digital transformation at the enterprise level on carbon emissions from a micro perspective, in the context of scarce mining resources. The study also conducts a mechanism analysis and test based on the following three aspects: the internal control effect, innovation effect and green supply chain optimization effect, all of which enrich the existing theoretical research. Additionally, the study also investigates the heterogeneous effect of enterprises' digital technologies (DT) on carbon emission reduction. Grounded on the data of listed companies from 2011 to 2020, this study discusses the influence of enterprise digitalization on the low-carbon energy transition using regression. The findings entail that DT enable organizations to control industrial processes, optimize resource allocation, cut energy consumption and lower carbon emissions, reducing environmental impact and promoting economic growth. Secondly, it not only supports economic growth and sustainable development but also promotes resource conservation and environmental stewardship. Digital transformation enables firms to better understand resource use and carbon emissions during industrial processes, leading to effective energy savings and emission reductions. Digitalization can shift firms to low-carbon sectors such as service and high-tech, lowering reliance on mineral resources and providing the groundwork for long-term economic growth. To reduce carbon emissions, governments and corporations should prioritize digital transformation efforts. Policy advice, financial support and technology innovation can help organizations accelerate their digital transformation journey.

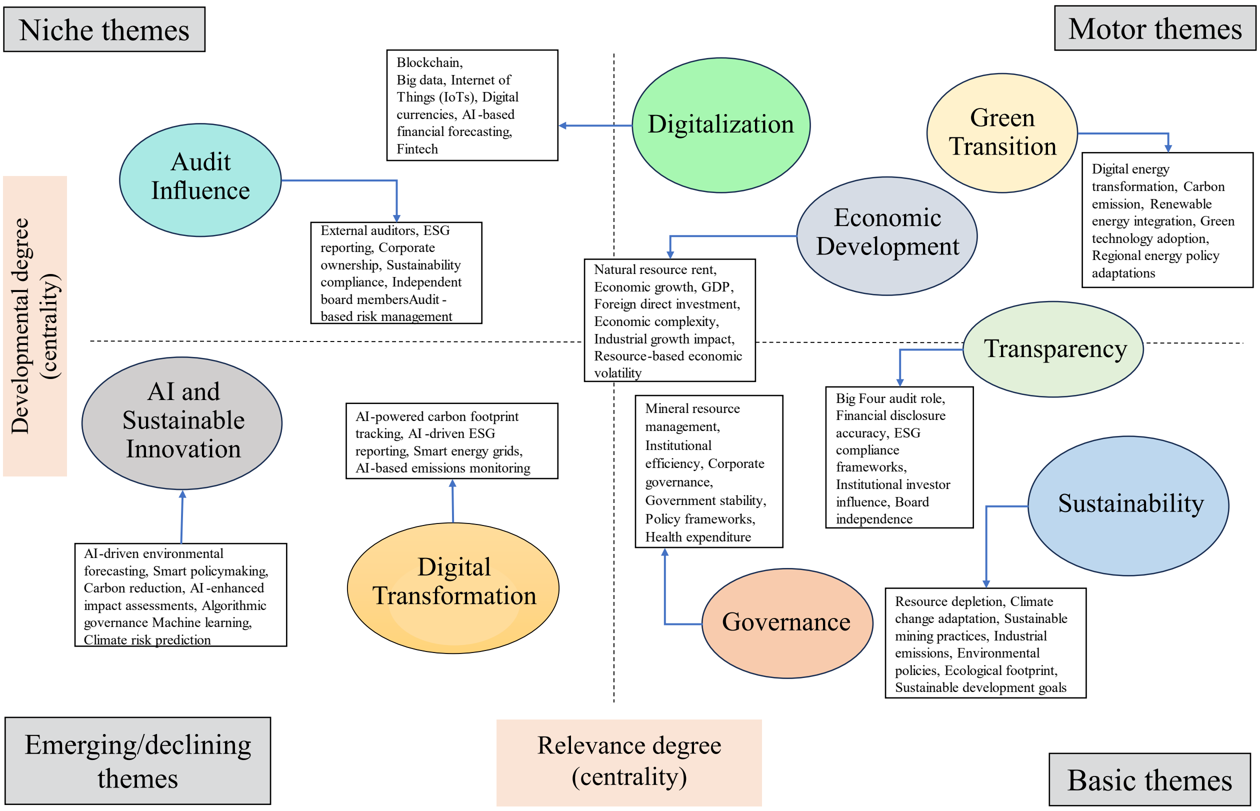
Ren *et al*. investigate the nexus of mineral and governance policies with income inequality while exploring the importance of per capita income, health expenditure and poverty. The study examines the impact of mineral resource utilization on income inequality in the Chinese economy. The paper analyses the impact of government indices/indicators on poverty, regulatory quality and government stability using several econometric models from 1984Q1 to 2023Q4. The study uses both parametric and non-parametric models to ensure accurate results. The study found that improving mineral resources, health expenditure, governance, regulatory quality and poverty headcounts can dramatically reduce income inequality. The wealth generated by mining and health spending significantly increases the general public's standard of existence. Governance policies promote equal wealth distribution in the country. Income inequality in the region is mostly driven by per capita income and government stability. This report suggests improving mineral management, strengthening governance and increasing health expenditure to address income disparity. Additionally, the negative correlation between mineral resources indicates good management. Mineral rent earnings must be correctly allocated to support services such as education and healthcare. This benefits lower-income groups by closing the rich-poor divide, as the underprivileged frequently lack access to necessities such as healthcare and education. The research recommends introducing tax measures for the wealthy to ensure equitable distribution of income and resources. Investing in healthcare facilities for lower-income populations can ease financial burdens on the poor. Subsidizing health facilities improves residents' health and reduces income inequality, leading to a healthier society and increased economic productivity.

Authors	Research question	SDGs addressed	Data and sample	Analytical method	Findings and conclusions
Xuan *et al.*	RQ1 – How do mineral resources affect economic growth in Global South regions? RQ2 – What are the causes of digital adoption and its effects on inclusive development? RQ3 – How do corruption control, government efficiency and regulation affect economic progress and attainment of sustainable growth?	SDG8: Decent work and economic growth	Data from emerging economies from the Global South (1996–2022)	Method of moments quantile regression	The analysis identifies drivers and constraints to sustainable economic development, offering valuable insights for equitable growth, technological innovation and effective governance. Understanding the complex interactions between mineral resources, the digital economy, governance and sustainable development in developing economies can lead to focused initiatives to strengthen emerging economies and increase prosperity.
Liu *et al.*	RQ1 – How can external audits influence corporate transparency and accountability in the realm of environmental sustainability? RQ2 – How do independent directors, female directors, the presence of institutional investors and state ownership moderate the relationship?	SDG13 – Climate action SDG5 – Gender equality	Chinese publicly listed companies	Panel count models: Poisson and negative binomial	The study concludes that the government should establish an independent environmental auditing organization to regulate and audit environmental disclosures, especially those conducted by Big Four businesses and state-owned enterprises. Additionally, increasing the representation of female and independent directors can also help achieve this goal and independent directors should be empowered with greater authority to influence board decisions especially related to ESG issues.
Baita *et al.*	RQ1 – How do mineral rents, GDP per capita, forest area and renewable freshwater resources affect the ecological footprint in the Global South? RQ2 – What specific gaps exist between environmental regulations and management practices, and how do these gaps affect environmental sustainability in the mining sector?	SDG13 – Climate action	Countries within the Global South, especially Brazil, India, Pakistan and Indonesia (1990–2020)	Augmented mean group (AMG) regression and quantile regression	The study finds that the link between economic activity and the environment is complex. These findings emphasize the importance of understanding the various elements that influence environmental regulations. To promote mining sustainability, each country requires solutions tailored to its demands. Policymakers should consider their country's distinct economic and environmental factors while developing policy. By balancing economic growth and environmental protection, mining companies can reduce negative impacts and encourage better resource management.
Zhao *et al.*	RQ1 – How does digitalization promote the low-carbon transformation of corporate energy?	SDG13 – Climate action	Listed companies of China (2011–2020)	Regression	The findings highlight how digital technologies enable organizations to control industrial processes, optimize resource allocation, cut energy consumption and lower carbon emissions, reducing environmental impact and promoting economic growth. It not only supports economic growth and sustainable development but also promotes resource conservation and environmental stewardship. Digital transformation enables firms to better understand resource use and carbon emissions during industrial processes, leading to effective energy savings and emission reductions.
Ren *et al.*	RQ1 – Do mineral resource utilization and governance policy induce income inequality?	SDG 10 – Reduced inequalities	China (1984Q1 to 2023Q4)	Quantile, regression, parametric and non-parametric models	The findings indicate that improving mineral resources, health expenditure, governance, regulatory quality and poverty headcounts can dramatically reduce income inequality. The wealth generated by mining and health spending significantly increases the general public's standard of existence. Governance policies promote equal wealth distribution in the country. Income inequality in the region is mostly driven by per capita income and government stability. This report suggests improving mineral management, strengthening governance and increasing health expenditure to address income disparity.

2.1 Coverage and expansions of the special issue

To gain a comprehensive understanding of the existing literature on the topics explored in this special issue, we conduct a thematic analysis using the keywords from the featured papers. The resulting thematic map (Figure 1) provides insights into the current knowledge landscape in this field. This map classifies topics based on centrality and density, following the established framework (Cobo *et al.*, 2015). Centrality reflects the degree of connection between themes, while density measures the strength of internal linkages within a topic (Aparicio *et al.*, 2019). The strategic diagram is structured into four quadrants, representing different thematic categories: motor themes, peripheral/niche themes, emerging or declining themes and basic themes (Sharma *et al.*, 2022; 2024).

Figure 1: Thematic map of scholarship in related areas



Source: Authors' own elaboration

The basic themes quadrant consists of well-established foundational topics that form the backbone of this field. Key themes in this quadrant include *governance* (which includes mineral resource management, institutional efficiency, corporate governance, government stability, health expenditure and policy frameworks), *transparency* (Big Four audit role, financial disclosure accuracy, ESG compliance frameworks, institutional investor influence and board independence) and *sustainability* (which includes resource depletion, climate change adaptation, sustainable mining practices, industrial emissions, environmental policies, ecological footprint and sustainable development goals). One study investigates the impact of Big Four audit firms on corporate environmental disclosure in China, highlighting the moderating role of governance structures in ensuring transparency (Liu *et al.*). Another examines the nexus between mining and ecological footprint in the Global South, identifying governance gaps that contribute to environmental degradation (Baita *et al.*). These studies provide valuable insights into regulatory frameworks and sustainability practices, which remain essential to corporate and policy decision-making. Future research should further explore the integration of governance mechanisms with environmental sustainability to enhance corporate accountability.

Motor themes are highly developed and central to this field, characterized by their strong influence on both theoretical and applied research. This quadrant includes *digitalization* (blockchain, big data, internet of things (IoTs), digital currencies, AI-based financial forecasting and fintech), *economic development* (natural resource rent, economic growth, GDP, foreign direct investment, economic complexity, industrial growth impact and resource-based economic volatility) and *green transition* (digital energy transformation, carbon emission, renewable energy integration, green technology adoption and regional energy policy adaptations). Zhao *et al*. investigate the role of digitalization in China's low-carbon transition, emphasizing the contributions of AI, big data and the internet of things in optimizing energy systems and reducing emissions. Xuan *et al*. discuss the relationship between digital infrastructure, governance and economic sustainability in emerging economies. These studies illustrate how technological advancements are reshaping corporate and policy strategies for sustainability. Moving forward, research should focus on refining AI-driven models for predictive sustainability management and energy efficiency optimization.

In the top-left quadrant of the thematic map, which indicates the niche/peripheral themes, there is only one theme, *audit influence* (which is related to external auditors, ESG reporting, corporate ownership, sustainability compliance, independent board members and audit-based risk management). The study highlights the role of independent directors and institutional investors in moderating corporate environmental disclosure, providing a detailed view of the impact of governance structures (Liu *et al.*). The study suggests that targeted interventions, such as sector-specific sustainability reporting guidelines, could enhance compliance. Future research should investigate cross-country regulatory variations and their impact on sustainability disclosure effectiveness.

Emerging themes represent nascent research areas with significant potential for future development. This quadrant includes *AI and sustainability innovation* (AI-driven environmental forecasting, smart policymaking, carbon reduction, AI-enhanced impact assessments, algorithmic governance, machine learning and climate risk prediction) *and digital transformation* (AI-powered carbon footprint tracking, AI-driven ESG reporting, smart energy grids and AI-based emissions monitoring). Baita *et al*. highlight the environmental impact of mining in the Global South and propose policy interventions to bridge the gap between regulations and sustainability outcomes. Zhao *et al*. highlight the need for regional policy adaptations to optimize the role of digital transformation in sustainability. These findings point to the growing relevance of integrating AI and digital solutions into environmental governance frameworks. Future research should explore the role of AI-driven decision-making in improving corporate ESG performance and the long-term impact of digital policies on environmental outcomes.

Motivated by the papers in this special issue, we identify several promising research opportunities and approaches that can be explored further:

1. To enhance governance in natural resource management, future studies can explore the role of AI in optimizing governance frameworks for sustainable resource extraction and environmental compliance. Machine learning models can be developed to track policy efficiency, detect regulatory gaps and enhance decision-making in mineral resource management.
2. To advance digital sustainability frameworks in energy policy, research can investigate AI-based energy management systems that optimize resource allocation, forecast energy demand and enhance renewable energy integration. This includes the application of blockchain and AI to improve carbon tracking and corporate sustainability reporting.
3. Exploring the intersection of digital finance and resource economics helps examination of AI-driven fintech solutions to improve financial transparency in extractive industries, streamline mineral trade transactions and promote sustainable investment in resource economies. Future studies can analyse the effectiveness of digital currencies, smart contracts and decentralized finance in improving governance.
4. Investigating the role of AI in sustainable mining practices can help future research assess how AI and IoT applications enhance efficiency, reduce waste and minimize environmental risks in mining operations. Studies can explore AI-driven risk assessments for mining sites and automated monitoring systems for compliance enforcement.
5. To evaluate audit-based sustainability enforcement mechanisms, researchers can further examine the impact of audit institutions on corporate ESG reporting, focusing on variations in governance structures, industry-specific compliance frameworks and the influence of independent board members on transparency.

The future research directions outlined in this editorial present a structured roadmap for integrating AI into multiple aspects of sustainable development, particularly in natural resource management, energy policy and corporate governance. Scholars and practitioners can contribute to efficient and responsible resource consumption by exploiting AI-driven decision-making, enhancing financial transparency and optimizing sustainability frameworks. On the policy front, there is a growing need to integrate AI solutions into regulatory processes, carbon-reduction strategies and ESG compliance mechanisms. In practice, stakeholders should prioritize AI-based governance models to drive sustainable energy transitions, improve corporate accountability and advance digital transformation in extractive industries.

This special issue brings together a diverse range of research methodologies, perspectives and analytical frameworks that extend across multiple disciplines and geographic regions. By incorporating empirical, conceptual and review-based studies, we aim to broaden the scope of academic inquiry into the intersection of AI, sustainability, governance and resource management. The insights presented in these papers will contribute to the ongoing discourse in this rapidly evolving field and serve as a valuable resource for policymakers, corporate leaders and scholars striving to develop more effective and equitable strategies for sustainable economic and environmental development.

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