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China-Africa Science, Technology, and Innovation Collaboration. M. Muchie, A. Baskaran, M. Tang (Eds.), Springer 2024

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Abstract. This book review critically examines China-Africa Science, Technology, and Innovation Collaboration, edited by Mammo Muchie, Angathevar Baskaran, and Mingfeng Tang. The volume explores the multifaceted nature of science, technology, and innovation (STI) partnerships between China and African countries, highlighting historical trajectories, institutional frameworks, and sectoral engagements. Through empirical data and case studies, the book reveals how these collaborations contribute to capacity building, technology transfer, and sustainable development. Key sectors such as agriculture, healthcare, renewable energy, and digital infrastructure are analyzed to showcase the tangible impacts of China-Africa STI initiatives. The review underscores the editors' balanced approach in acknowledging the strategic opportunities offered by these partnerships while also addressing the asymmetries in power, intellectual property concerns, and environmental implications. The book makes a significant scholarly contribution by offering critical insights into the evolving dynamics of South-South cooperation in the innovation domain. It provides a foundation for rethinking global innovation systems through the lens of equitable collaboration and localized development. This review recommends the book as an essential reference for researchers, policymakers, and practitioners interested in the intersection of STI, international relations, and development economics.
Keywords. China-Africa Relations; Science, Technology and Innovation (STI); Technology Transfer; South-South Cooperation; Sustainable Development.
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Book Review

In an era where international collaborations play a crucial role in shaping technological advancements and economic development, *China-Africa Science, Technology, and Innovation Collaboration*, edited by Mammo Muchie, Angathevar Baskaran, and Mingfeng Tang, presents a comprehensive analysis of the evolving relationship between China and Africa in the fields of science, technology, and innovation (STI). The book

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provides a detailed exploration of the mechanisms, policies, challenges, and opportunities that define this collaboration. By addressing both the successes and the limitations of China-Africa STI partnerships, this volume offers a holistic view of the dynamics at play and provides valuable insights for policymakers, academics, and industry stakeholders.

This review delves into the book's structure, major themes, key arguments, and critical perspectives while evaluating its contributions to the existing literature on international STI collaborations. The book's extensive use of empirical data, case studies, and policy analysis makes it a significant contribution to the understanding of how China and African nations engage in technological exchanges, knowledge transfer, and innovation-driven economic development.

Book Structure and Key Themes

The book is organized into several interrelated chapters, each addressing a specific aspect of China-Africa STI collaborations. These chapters explore the historical context, policy frameworks, sectoral partnerships, case studies, and future prospects of STI cooperation between China and African nations. Below is an outline of some of the key themes explored in the book:

Historical and Policy Context

One of the book's early chapters contextualizes China-Africa STI collaboration by tracing its historical evolution. China's engagement with Africa in scientific and technological fields is not a recent phenomenon; rather, it has developed over several decades, influenced by geopolitical, economic, and diplomatic factors. The book highlights key policy frameworks, such as China's Forum on China-Africa Cooperation (FOCAC) and the Belt and Road Initiative (BRI), which have facilitated STI partnerships through institutional and financial support.

The authors also explore Africa's policy responses to Chinese investments in STI, analyzing how African governments have designed national innovation strategies to maximize the benefits of these collaborations. The book critically examines whether these policies align with long-term sustainable development goals or primarily serve short-term economic interests.

Mechanisms of STI Collaboration

A significant portion of the book is dedicated to examining the mechanisms through which STI collaborations between China and Africa take place. These include:

- Bilateral Agreements and Research Partnerships: China has signed numerous bilateral STI agreements with African nations, fostering collaborative research in fields such as renewable energy, agriculture, healthcare, and digital technology.

- Technology Transfer and Industrial Cooperation: The book discusses how Chinese firms and institutions facilitate technology transfer to African counterparts, enabling skills development and infrastructure improvement.
- Higher Education and Capacity Building: A critical component of STI collaboration is the educational exchange between China and Africa, including scholarships for African students, joint research programs, and university partnerships.

The book evaluates the effectiveness of these mechanisms, highlighting both the opportunities they create and the challenges they present in terms of sustainability and knowledge diffusion.

Case Studies: Sectoral Insights

The book incorporates a series of case studies that provide concrete examples of how China-Africa STI collaborations have manifested across different sectors. Some notable areas examined include:

- Agriculture and Food Security: China has played a significant role in supporting agricultural research in Africa, introducing new farming techniques, hybrid seeds, and irrigation technologies to improve food security.
- Renewable Energy and Infrastructure Development: Investments in renewable energy projects, including solar and hydroelectric power, illustrate China's commitment to STI collaborations that promote sustainable development.
- Healthcare and Biomedical Research: The book highlights collaborative efforts in healthcare innovation, particularly in response to pandemics and infectious diseases. Chinese pharmaceutical firms have partnered with African research institutions to develop affordable medical solutions.
- Digital Technology and E-Commerce: The role of Chinese firms such as Huawei and Alibaba in expanding Africa's digital economy is critically examined, with discussions on both the opportunities for technological advancement and the risks related to data security and economic dependence.

Challenges and Criticisms

While the book acknowledges the benefits of China-Africa STI collaborations, it also presents a critical analysis of the challenges and potential drawbacks. Some of the key concerns include:

- Asymmetry in Power and Benefits: The book highlights concerns that China's economic and technological dominance in the partnership may limit Africa's ability to set the terms of collaboration. The risk of over-reliance on Chinese technology and investment raises questions about Africa's long-term innovation independence.
- Intellectual Property and Technology Sovereignty: Some African policymakers and academics express concerns over intellectual property

rights, arguing that China's technological interventions may not always prioritize local innovation capacity-building.

- Environmental and Social Impacts: While Chinese investments have facilitated rapid infrastructure growth in Africa, the book critically assesses the environmental and social consequences of some large-scale projects, particularly in mining, energy, and urban development.

Future Prospects

The concluding chapters of the book speculate on the future trajectory of China-Africa STI collaborations. The authors argue that while economic and technological synergies between China and Africa are likely to deepen, the nature of these collaborations must evolve to address sustainability concerns and ensure equitable benefits. Recommendations include:

- Strengthening African innovation ecosystems through enhanced policy coordination and local capacity building.
- Encouraging greater participation of African institutions in setting the terms of collaboration.
- Expanding South-South cooperation to diversify STI partnerships beyond China.

Conclusion

China-Africa Science, Technology, and Innovation Collaboration is a critical and timely contribution to the study of international innovation partnerships. By providing a detailed and balanced assessment of China-Africa STI engagements, the book serves as a valuable resource for scholars, policymakers, and industry professionals. As global economic and technological landscapes continue to evolve, the insights presented in this book will remain relevant for shaping future STI collaborations between China and Africa. This book is an essential read for anyone interested in understanding the broader implications of international technology exchanges and their role in shaping sustainable development across emerging economies.

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