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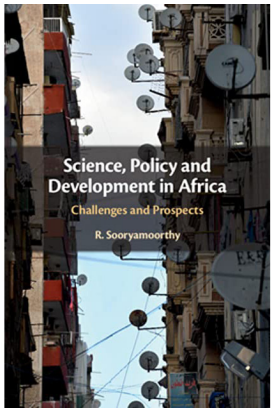
Science, policy and development in Africa: Challenges and prospects



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Science potential for development in Africa not yet fully realised

Radhamany Sooryamoorthy is Professor of Sociology in the School of Social Sciences at the University of KwaZulu-Natal in South Africa. His field of interest is the contribution of science to development in Africa compared to more developed nations. This book summarises his recent research into this topic.

Structured over seven chapters, Sooryamoorthy maps the evolution, development and implications of scientific practices in both colonial and contemporary Africa. In this process he attempts to answer 10 research questions. They deal inter alia with issues such as (1) the extent to which science was undertaken historically in Africa under colonial rule; (2) the extent to which it is currently practised and prioritised through systematic science, technology and innovation approaches, policies and funding; (3) which African countries do what in this regard and why, and (4) how weaknesses in current practices can be improved to facilitate and support development on the continent (p. 25–26).

In Chapter 1, concepts such as science, technology, innovation and development, as well as their inter-relationships within the African context are explained. Sooryamoorthy then summarises his overall conclusions which point to a direct correlation between the availability of scientific knowledge, development and wealth creation, both in the literature and from his own empirical data. However, he also finds that the generation of knowledge itself (i.e. scientific productivity) is not always aimed at wealth creation (p. 6). Rather, scientific research is stimulated by a need to find solutions for intractable problems and to improve efficiency and effectiveness. Science is, therefore, not necessarily driven by a desire to improve economic growth, but rather to resolve technical and other problems (p. 7).

Sooryamoorthy's main theoretical points of departure include Gibbons et al.[1] and Krishna et al.[2] He also uses Goldemberg's[3] different models to assess the relationship between science and development as illustrated by US and Japanese practices, and Moravcsik[4] with respect to a short-term economic growth focus for scientific research, as opposed to a longer-term development impact. The conceptualisations of Schott[5], Nagtegaal and De Brun[6], and Castells[7], respectively, are furthermore employed with regard to modernisation, dependency, and the unequal and discriminatory impact of scientific research activities on development outcomes in core and peripheral contexts (p. 30–31).

These different theoretical approaches provide interesting and potentially useful conceptual frameworks to assess the impact of scientific research activities on development in both colonial and contemporary African societies. However, despite the many strengths of the book, the author unfortunately does not summarise in his other chapters, or in his final conclusions, the extent to which his findings are congruent with, or contradicting, these theoretical frameworks.

The author undertakes empirical data collection mainly though a systematic bibliometric approach (p. 33, 36). The research findings and conclusions are summarised in Chapter 2, while more detailed qualitative and quantitative data supporting these findings are given in Chapters 3 to 5.

In Chapter 2, the author summarises the main differences in approach between Anglophone and Francophone African countries, including how colonial science research practices focused mainly on finding solutions to urgent, short-term health- and agriculture-related problems and issues in their respective home countries, with little regard to local needs and challenges in the African context (p. 42). This conclusion is fully in line with the general nature and focus of colonial governance in Africa. However, he also details how decolonisation since the 1960s has not immediately resulted in significant changes to the practise of scientific research and he explains this as emanating from the negative impacts of the colonialist legacies, aggravated by various contra-productive political, educational and economic management strategies of successive post-colonial governments (p. 44–48).

Nonetheless, Sooryamoorthy finds that there has been a slow increase and improvement in science research in African countries since independence. However, these improvements remain minimal owing to serious political instability, institutionalised corruption and ideologically competing policy priorities as well as the need to provide basic infrastructure and services. Scientific research in Africa remains driven largely by foreign donors and researchers. This is problematic, because African priorities, and not international donor priorities, are needed (p. 19–20).

A number of tables, lists and analyses which provide substantiation for the above findings are presented in Chapters 3 and 4. Chapter 3 gives extensive, and in the opinion of this reviewer, sometimes unnecessarily detailed, lists, descriptions and summaries of 549 427 research publications (p. 63) in different sectors of African countries between 1945 and 2015. In addition, detailed analyses and assessments of funding allocations for these activities are provided (p. 74). In Chapter 4, the author lists, classifies, compares and assesses the sectoral research areas on which these science publications focussed, as well as the relative strengths and weaknesses of individual African countries in this regard (p. 101).

The logic and relevance of presenting this compendium of descriptive lists of publications, sectoral foci and funding allocations in the minutest detail in the text is not clear. The readability of the book would have been improved if these details had been contained in separate annexures at the end of the text. However, this approach and content are consistent with the author's explicitly stated intention to map the development of historical and contemporary science practices in different countries in Africa, both under colonialism and thereafter.

Chapter 5 deals with the importance of scientific collaboration in Africa, within the discriminatory core–periphery model of scientific impact referred to in Chapter 1. Again, there is detailed comparative historical and contemporary technical data to substantiate his conclusion that '… the colonial past continues to influence research agendas and patterns of collaboration' (p. 150). However, the conclusion is correct that the situation is changing and that there is increasing collaboration among African countries when it comes to scientific research (p. 174).

Chapter 6 assesses the consequences of the finding that systematic science policies and policy systems in Africa are either largely absent or, where they do exist, are not synchronised or integrated with other sectoral policies, technologies and innovations to ensure sustainable development outcomes and impacts (p. 198). Sooryamoorthy concludes that S&T policy development in Africa is still seriously underdeveloped as a result of colonial practices, and he correctly identifies a number of important policy design and implementation improvements that need to be made by African governments to fast-track more successful science impacts in those societies, including more effective and better-informed policy and implementation. At the same time, he acknowledges the complicating nature of policymaking in politically volatile situations or where there is conflict. (p. 217–219, 221). His plea for the African Union to intervene, however, is – in the opinion of this reviewer – probably doomed to fail, because of the inability of the African Union so far to persuade its members to subject national interests to regional, continental or global needs.

In his concluding Chapter 7, the author probably correctly identifies the main science policy constraints in Africa as different subjective national policy priorities as well as objective implementation capacity. They are indeed the main bugbears of failed policy experiments across the world. Improved political commitment to better education, training, evidence-informed policy processes (including local, indigenous knowledge systems), and better management and governance of those activities are important strategic directions for improvement (p. 234, 243). (See Cloete et al.[8,9] for more details on how to achieve this.) In order to achieve these transformations, the debilitating brain drain from Africa to more developed nations also clearly must be turned around (p. 253–256).

Significant improvements in the nature and constructive impacts of sustainable, decolonised, democratic governance in African countries are possible as explained elsewhere.[10,11] The author also correctly identifies better use of Fourth Industrial Revolution technologies in Africa as a prerequisite for success. However, he acknowledges that the current weak state of digital empowerment on the continent is a potentially serious obstruction (p. 267).

The book's final conclusion is that:

> *…considerable change will have to occur if Africa wants to improve its scientific systems and capabilities to serve the interests of the countries and the people on the continent… After more than half a century of independence, it is time that Africa grows the science, technology and innovation that will ultimately take the continent to an advanced level of development.* (p. 287)

This conclusion is essentially correct, but it is probably over-idealistic, given the current African reality of political instability, ideologically bad economic decisions, inadequate and unreliable infrastructure and services as well as weak democratic governance practices. In reality, colonial policy still dominates the political psyches of many African nations, 80 years and four generations since decolonisation. This is a serious indictment – both of the respective colonial powers and of the post-colonial governments.

This book suggests a number of practical policy strategies to improve scientific contributions to development in Africa and identifies the main constraints and obstacles that need to be overcome in order to achieve this goal. However, despite the author's acknowledgement of some recent progress, the short- and medium-term outlooks to achieve this goal remain bleak.

The largely descriptive nature of the book, a significant degree of repetition in writing style and the lack of succinct chapter summaries of dense, technical content, complicate the reading experience, but do not overshadow the strengths of the book. With this publication, Sooryamoorthy has made a valuable new technical and reference contribution to the study of science and development in Africa, albeit that the price of the book is steep in South African monetary terms. His contribution, however, would have been even more significant had he undertaken a final concluding assessment of the extent to which the practise of science in colonial and post-colonial Africa relates to the theoretical explanatory and predictive frameworks that he used to structure his approach to the research.

References

1. Gibbons M, Limoges C, Nowotny H, Schwartzman S, Scott P, Trow M. The new production of knowledge: The dynamics of science and research in contemporary societies. London: Sage Publications; 1994.
2. Krishna VV, Waast R, Gaillard J. Globalization and scientific communities in developing countries. In: UNESCO World Science Report 1998. Paris: UNESCO; 1998. p. 273–287.
3. Goldemberg J. What is the role of science in developing countries? Science. 1998;279:1140–1141. https://doi.org/10.1126/science.279.5354.1140
4. Moravcsik MJ. Two perceptions of science development. Res Policy. 1986;15:1–11. https://doi.org/10.1016/0048-7333(86)90018-1
5. Schott T. Ties between center and periphery in the scientific world system: Accumulation of rewards, dominance and self-reliance in the center. J World Syst Res. 1998;4:112–144. https://doi.org/10.5195/jwsr.1998.148
6. Nagtegaal LW, De Brun RE. The French connection and other neo-colonial patterns in the global network of science. Res Eval. 1994;4:119–127. https://doi.org/10.1093/rev/4.2.119
7. Castells M. The university system: Engine of development in the new world economy. In: Ransom A, Khoo S-M, Selvaratnam V, editors. improving higher education in developing countries. Washington DC: The International Bank for Reconstruction and Development / World Bank; 1993. p. 65–80.
8. Cloete F, De Coning C, Wissink H, Rabie B, editors. Improving public policy for good governance. 4th ed. Pretoria: JL Van Schaik Publishers; 2018.
9. Cloete F. The complex dynamics of evidence-informed policy change. Administratio Publica. 2016;25(1):93–120. https://journal.assadpam.net/index.php?journal=assadpam&page=issue&op=viewIssue&path%5B%5D=36&path%5B%5D=28
10. Cloete F. Measuring progress towards sustainable development in Africa. Afr J Public Affairs. 2015;8(3):51–74. https://repository.up.ac.za/bitstream/handle/2263/58167/Cloete_Measuring_2015.pdf?sequence=1&isAllowed=y
11. Cloete F, Auriacombe C. Revisiting decoloniality for more effective research and evaluation. Afr Eval J. 2019;7(1):1–10. https://doi.org/10.4102/aej.v7i1.363