

RESEARCH EXCELLENCE AND SUSTAINABLE DEVELOPMENT IN AFRICA: AN OVERVIEW OF CURRENT CONCERNS AND PROSPECTS IN THE 21ST CENTURY

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ABSTRACT

This paper uses the concept of “research excellence” to investigate the contribution of research to sustainable development in Africa and propose strategies for enhancing research practice in the region. Specifically, the paper the causal relationship between research and sustainable development, the concept of research excellence, the factors that retard the growth of research in Africa, and propose strategies for enhancing research excellence in the African region. Significantly, the paper proposes that to improve the relevance and impact of research in sustainable development there is a need to enhance quality in assurance in research processes, intense investments in research infrastructure, a close collaboration between various stakeholders such as research agents, the local community, policymakers, and practitioners. More importantly, there need to revisit the scholarly communication ecosystem in the region with the view to make dissemination and access research information on the continent affordable and visible through more investment in digital libraries, repositories, and adoption of open access publishing of research findings

INTRODUCTION

Research has been identified as a key driver of development, and African research, in particular, has been identified as consequential not just for the continent but also for the whole world (The African Academy of Science (AAS), 2020; Sangeda, 2016). At the same time, a review of the literature indicates disagreements among research practitioners about the contribution of African research to the global knowledge pool, as well as its impact on sustainable development on the continent (Kraemer-Mbula, Tijssen, Wallace, Matthew, and McLean, 2020; Czech Rectors' Conference, et al, 2020, Duermeijer, Amir, and Schoombee, 2018).

This paper examines critical issues related to the contribution of research to development in Africa and proposes strategies for enhancing research practice in the region. Specifically, the paper examines first, the causal relationship between research and sustainable development, and secondly, the notion of research excellence as a global yardstick for assessing the quality of research. Thirdly, it reviews the challenges facing research in Africa in terms of levels, quality and relevance. Fourthly, it reviews the factors that retard the growth and the contribution of research ecosystems in the region, and finally, proposes strategies for enhancing research excellence in the African region. The paper argues that to improve the research excellence on the continent, it is important to enhance the quality of research processes, improve research infrastructure, and forge a close collaboration between researchers and the local community, policymakers, and practitioners. More importantly, there need to re-visit the scholarly communication ecosystem in the region with the view to making research output more visible, affordable, and accessible to scholars, researchers, policymakers as well as other user communities.

Statement of the problem

Research is widely recognized as core to sustainable development (AESA, 2020; Toivanen & Ponomarev, 2011). Research in Africa is also viewed as critical globally partly because this is the continent with the fastest-growing population, talent for new ideas, knowledge, and solutions for global problems (Kraemer-Mbula, et. al, 2020). At the same time, a review of the literature reveals contradicting perspectives on the vitality of research in Africa. On one hand, there are claims that despite the acknowledged importance of African research, its contribution to sustainable development on the continent is negligible and highly hampered by a variety of challenges (The African Academy of Sciences, 2021; Kraemer-Mbula, et. al, 2020; Duermeijer, Amir, and Schoombee, 2018) On the opposite side, there are observations that research in Africa has dramatically improved and therefore its impact cannot be underestimated (Schemm, 2013; Confraria and Godinho, 2015).

In this ambivalent situation, there is a constant need to review and fill the existing knowledge gap on the status and performance of research in Africa. Hence the purpose of this investigation was to explore the key issues that affect the contribution of research to sustainable development in Africa and propose strategies for enhancing research practice in the region. This review will contribute to the current discourse on research excellence on the continent.

Specific objectives

The investigation was guided by the following objectives:

- ◆ To evaluate the relationship between research and sustainable development
- ◆ To examine the challenges facing research excellence in Africa
- ◆ To propose strategies for enhancing research excellence in the African region

Methodology

This paper is based on a systematic review of current literature undertaken guided by the stated purpose and objectives and the emerging thematic issues. These are concretized into current issues, perspectives, arguments and proposals formulated on a way forward in improving the contribution of research to sustainable development in the African region.

Structuring the relationship between research and sustainable development

The notion of sustainable development

While development is defined as any positive changes in the quality of life of the people, sustainable development has been defined in many ways. However, a universally accepted definition is that provided by the Brundtland Commission which states that sustainable development is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). Generally, development is achieved through the exploitation of the natural as well as the social world to create both economic and social value that makes the quality of life for the people better and concomitantly happier. When we

consider the notion of “sustainability” into the discourse, then we can talk of “development that lasts” (Pearce and Barbier, 2000). Therefore sustainable development implies exploiting natural and social resources to achieve economic and social improvement of life of the current generation while maintaining the ability of future generations to also enjoy the same quality of life.

Elements of research - sustainable development nexus

Research per se does not lead to sustainable development, however; there is a centuries-old recognition that a positive relationship exists between investments in research and levels of development in any given country (Nicolaidis, 2014). Experts today concur that research is the firm foundation for sustainable development. There are different ways to conceptualize this relationship between research and sustainable development. In Figure 1 a simple structural model of the mediating processes through which research impacts sustainable development is presented. These processes can be summarized into three: innovation policy-making and review, and evidence-based practice

Figure 1: Research-Sustainable development nexus



i. Innovation

Innovations are widely regarded as the primary driving force of economic development (Elg, 2014). Innovation refers to any novel or improved product or a process, and significantly different from the previous one, of achieving some goal (OECD/Eurostat, 2001). According to OECD (2002), innovation involves creative activity undertaken systematically to increase the amount and quality knowledge available to those who need it, including the human situation, society, and nature, and the use of this knowledge to devise new applications and methods of doing things. Examples of innovations are improved product, service or process, new marketing methods, or new ways of organizing business, work organization, or external relations.

Innovation is critical because it evolves more effi-

cient and effective ways of solving problems and current challenges facing society, via the production of goods and provision of services. These new products, processes, and methodologies, in turn, initiate new waves of economic growth and improvement in quality of life for the people. Notably the mechanics through which new products and processes is achieved presumes research activity to generate the kind of knowledge which provides fresh ideas and technologies. These are in turn transformed into innovations in form of new concepts, processes and techniques, and inventions to bring about development via prosperity, positive social changes, more efficient use of resources to create economic value and address social challenges.

ii. Evidence-based practice

Evidence-based practice (EBP) refers to the use of research findings as to the basis for interventions in various many situations (Johnson & Daughterty, 2008). It involves cultivating a spirit of inquiry in problem-solving or carrying out activities in any sector of life by examining carefully the needed action, collecting the most relevant and evidence related to the issue at hand then combining the relevant evidence with own expertise in framing and carrying out action plans. The evidence-based approach, initially dominant in clinical practice is now applied in virtually every sector including teaching social work, business, agricultural extension work, and even politics for best results (Johnson & Daughterty, 2008). EBP is now advocated as the “golden standard” in activities aimed achieving sustainable development in every sector including health, education, agriculture, such as farming, in order to ensure that the best outcomes are achieved. The role of research in EBP is to generate research-based knowledge to inform decisions in day-to-day practice to achieve better outcomes that rhyme with the ideals of sustainable development.

iii. Policymaking and Analysis

Formulation of forward-looking and coherent policies is a prerequisite to sustainability in any country because it guides national strategies to achieve different SDG targets (High-level Political Forum on sustainable development, 2015). Similarly, for research to have a positive impact on development, it must generate the correct knowledge to guide setting up socio-economic policies. Global, the role of research in policy-making is recognized and indeed the use of empirical evidence has been credited with policy success in various sectors while poor results in others have been linked to its absence (Johnson & Daughterty, 2008).

The notion of research excellence

Research excellence (RE) has become a key concept in the research arena (Tijssen, 2003). This concept is multi-faceted, and debate still rages on its definition and how it should be operationalized especially in the context of the Global South, to achieve the best outcomes for its communities (Tijssen and Kraemer-Mbula, 2018). One definition is that research excellence refers to “research that is unusually good and surpasses ordinary standards, whose production is achieved through actions of integrity and which leads to products that are reliable, relevant and safe to the users (Tijssen & Kraemer-Mbula, 2017). While this definition is uncontested, there is ongoing global debate among research experts, funding agencies, as well as other players on the most appropriate indicators and metrics of research excellence (Kraemer-Mbula, et. al, 2020). Lately, the commonly accepted indicators of research excellence quality, relevance, impact, capacity building for research, and level of collaboration among interested parties.

Quality in research generally refers to the scientific rigor that is employed in the research process to guarantee the accuracy of findings and their dependability. According to the National Center for Dissemination of Disability Research (2015), quality of research refers to “the scientific process encompassing all aspects of research design, in particular, it pertains to the judgment regarding the match between the methods and questions, selection of subjects, measurement of outcomes, and protection of subjects, measurements of outcomes, and protection against systematic bias, non-systematic bias and inferential error”.

Several authorities have identified factors influencing the quality of research as the extent to which the research poses important questions that can be investigated empirically and which contribute to a useful knowledge base, applying methods that best address the research questions of interest (The National Research Council, 2002) have variously asserted that the discourse on research quality should be based on the ideals of scientific research including empirical using systematic procedures, sound theoretical underpinnings and a sound philosophy of science whether both positivist and post-positivist, etc.

To assess the relevance of research involves considering, the extent to which goals address the local needs. On a national scale, relevance can also refer to the sufficiency of the research enterprise in terms of coverage of general problems facing the country. These two issues allude to the extent to which the research enterprise addresses critical knowledge gaps in both the social and natural environment, which ultimately determines the suitability of the research findings to solve current and future problems.

Research impact can be conceptualized in terms of the level of uptake of research findings by intended users and other players including practitioners, ordinary citizens, policymakers, etc. The impact can also be defined as an effect on, or change or benefit to the economy, society, culture, public policy or services, health, the environment, or quality of life, beyond academia (REF 2014, 2014). In other words research impact answers, questions such as whether the research is applied in ordinary practice by both lay and experts or in policy formulation to guide social interventions in matters that affect the well-being of citizens. The impact can also be measured in terms of the extent to which research findings lead to innovation and in many cases, their usage to address social needs or are commercialized in form of innovations to generate wealth (The Alliance for Accelerating Excellence in Science in Africa (AESA), 2020)

The indicator capacity and capacity building is about sustainability of the research eco-system through appropriate investments setting up, maintain and improve the research infrastructure (Tijssen and Kraemer-Mbula, 2018). Research infrastructure includes the physical and virtual research facilities and equipment, soft elements such as library systems, communication networks, and computational centres, and the associated human resources which support the various stages of research and innovation activities including researchers, research technicians, and other supporting capacities including research managers, technicians, and librarians, who support production, dissemination and access to quality and relevant research (AESAs, 2020; Duermeijer, Amir, and Schoombey, 2018; Republic of Kenya, 2021).

Collaboration in research is seen as essential in producing findings which have a wider application and acceptability. Interdisciplinary collaboration ensures that the different aspects of a phenomenon, i.e. physical and social aspects of a research problem are addressed. Collaboration with policymakers and the community ensures that the actual needs of the community and policy priorities are better understood and addressed. According to Kraemer-Mbula, et. al, (2020) and Tijssen and Kraemer-Mbula, (2018) collaboration with interested parties includes a mechanism for obtaining and incorporating feedback and views from stakeholders on the value of the research for (end) users. All in all, collaboration is a strong foundation of research which aspires to be relevant to communities, practitioners and policymakers. It is the enabler for research that can lead to the transformation of the society, which can be applied in practice-based practice, create an impact through policy formulation and commercialization.

Challenges facing research in Africa

Overview

A review of the literature reveals several challenges that face research enterprise in Africa and which needs to be addressed in the research continent is to play a more meaningful in the attainment of sustainable development. These include inadequate research output compared to address the myriads of problems facing the continent, perceived low quality of research, limited relevance of research to the local challenges, foreign irrelevance in the setting of research agenda on the continent, poor research infrastructure, low intra-Africa research collaboration, low impact of research on practice and policy, low visibility and access to research output, and limited translation of research to innovations and commercial value.

Recent bibliometric data on trends on research in Africa

Mitchell, Rose, and Asare (2020) carried out a bibliometric survey to investigate the current state of educational research in sub-Saharan Africa in terms of issues quality, visibility, and responsibility for research agenda-setting. The findings of this study

as can be summarized as follows:

- ◆ There is exists an abundance of educational research output from Africa but this is dominated by a few countries such as Nigeria, Ghana, and Kenya
- ◆ There are disparities across the region in terms of the research quality when assessed in terms of peer-review
- ◆ Research output in the region is poorly visible, “overlooked and undervalued” in terms of citation rate, especially those which do not involve collaboration with researchers from the global North.
- ◆ There was some evidence of research foci and design being set by funding agencies or researchers from the global North,
- ◆ There are disparities in the alignment of the research agenda with the policy requirements in the region
- ◆ There is evidence of a tradeoff between research quality and quantity as evidenced by increasing publishing in predatory journals

Right from the beginning of COVID-19 research played a critical role in both short and long-term efforts to combat the pandemic. The immediate response to the pandemic was an unprecedented global research effort to guide mitigation strategies (Guleid, et al., 2021). As early as February 2020, barely a month after the outbreak of the pandemic, the Global Research Roadmap to guide a collaborative COVID-19 research agenda aimed at developing medical countermeasures was established (WHO, 2020). This early research aimed at developing diagnostic tests, treatments, and vaccines against the disease as well as address the huge gap in knowledge, attitude and practice among the populace, the state of preparedness of service providers in various countries, the transmissibility of the virus, the clinical spectrum of the disease, and its impact on health systems on a global scale (Desalagne, 2020; UNIDOC, 2020).

A recent extensive bibliometric study revealed that Africa is contributing to research and generating knowledge on how to combat COVID-19 especially on national preparedness and response to the pandemic including studies on therapeutics and vaccines. While findings confirm the potential of Africa to research to address local problems, they also indicated that:

- ◆ Most of the studies were funded by institutions based in the global North rather than African governments or local universities and national research institutions.
- ◆ There were limited clinical studies on vaccines and therapeutics in Africa and therefore an over-reliance on research findings in non-African countries to provide these interventions to African populations
- ◆ There was an over-representation of non-Africans on research on the continent

- ♦ There was an imbalance between original and non-original research being undertaken on the continent (questions on quality of research)
- ♦ There was uneven research productivity with over-concentration of in a few African countries such as South Africa, Nigeria, Ethiopia, Egypt, and Kenya (Guleid, et al., 2021).

Summary of challenges

i. Low levels of output and quality in research

It has been widely reported that research in Africa, including that research done in the universities, lags behind the rest of the world (Czech Rectors' Conference, et al. (2020). According to UNESCO (2015), although Africa is home to 15% of the world's population and 5% of the world's gross domestic product (GDP) the continent accounts for just 1.3 % of global investment in research and development (R&D) and 198 researchers per million inhabitants. Similarly, while Africa carries about 15 % of the global burden of disease its scientific output represents only 2.6% of the global share, meaning it's not producing enough evidence to address its challenges (African Academy of Sciences, 2020)

However, a review of the literature indicates that research in Africa is rapidly improving (Mitchell, Rose, and Asare, 2020) According to Elsevier (2017) Africa has by far the strongest growing scientific production: 38.6 % over 5 years from the start of 2012 to the end of 2016. There are also reports of improvements in research productivity and quality in universities in Africa, which can invigorate sustainable development on the continent (Czech Rectors' Conference, et al. (2020).

Questions persist whether research in Africa is "as good as research done elsewhere" Kraemer-Mbula, et al, 2020, Preface). Many experts aver that whereas there is room for improvement there is a rapidly increasing research talent in Africa and that African research is as good as any from the rest of the world (Mitchell, Rose, and Asare, 2020). Others have observed that the notion that research in Africa is low quality is a bias perception that arises from the prevailing conceptualization of research excellence which is based on contexts from Global North where research systems are more developed and resources are largely available and which evaluates research, based on output rather than impact on the community (Kraemer-Mbula, et al, 2020).

ii. Foreign control African research agenda

Two questions that arise now and then are: who sets the research agenda on the African continent and whether this agenda resonates well with needs of national needs of African countries as well as their communities, policymakers, and practitioners (Mitchell, Rose, and Asare, 2020). It is axiomatic that a research enterprise whose agenda is set outside the continent or is overly influenced by foreign donors will result in a research enterprise that does not align the socio-cultural contexts, priority policy issues, or directions which could result in faulty pol-

icy and solutions which are unsuitable to the most urgent problems in Africa because they do not align well with the contexts and aspirations of communities on the continent (AAS, 2021; Ndege, and Onyango, (2021)

The growing calls to decolonize science and redefine the concept of research excellence in Africa is rooted in an experience that to a large extent, the science agenda for the continent has been historically defined from outside and growing evidence of lack of equitable North-South partnerships in research and sharing of resultant knowledge in favour of North-based entities (Ndege, and Onyango, 2021). In other words, some partnerships on research in Africa are ingrained with the exploitation of the natural and human expertise in Africa, which results in a drain of ideas from the continent, without a tangible positive impact on the continent, or alienation of the yields, reminiscent of the shameful past slave labour, colonial exploitation of Africa's natural and human resources and modern-day unfair trading resources arrangement that favour the Global North (Marincola, and Kariuki, 2020).

Today there is a strong concern among research experts that that conceptualizing research excellence along with perspectives from the Global North actively discourages research on the more relevant local issues to develop indigenous solutions and innovations in favour of the global agenda (Tijssen and Kraemer-Mbula, 2018; Ndofirepi and Cross, 2016). This has led the Global South including Africa to rely excessively on Europe and North America for "validation of academic quality and respectability" (Sutz, 2020). The net effect of all these is that many governments and policymakers rely excessively on imported and often unsuitable knowledge which further delegitimizes local investments in innovation and therefore retards research on the African continent for Africans by Africans (Kraemer-Mbula, et al, 2020; Chataway, and Daniels, 2020).

iii. Poor research infrastructure

Many studies have highlighted the challenge of poor research infrastructure in the African continent characterized by inadequate legal and policy framework, low budgetary allocation, competition and silo mentality among institutions, rapidly changing technology, low investments in research by the public sector, and inability to attract and retain high-caliber researchers (Marincola & Kariuki, 2020 Duermeijer, Amir, and Schoombee, (2018). By all means, a weak research infrastructure in African universities and research institutions undermines the contribution of these institutions to the world's pool of knowledge (Abrahams et al. 2009). Specifically, experts have highlighted low levels of human resource capacity in universities in Africa, inordinate teaching responsibilities among faculty members, inappropriate incentives for research, and inability to afford access to high-quality research information databases (Mitchell, Rose, and Asare, 2020)

Iv. Low impact of research on policy, innovation, and practice

A disconnect has been observed to exist between research in Africa and the search for solutions to the challenges facing the continent. The first has to do with low levels of translation of research and innovations into products, policies, and practices that will improve and transform lives in Africa (Mitchell, Rose, and Asare, 2020; Duermeijer, Amir, and Schoombie, (2018). The second is low levels of commercialization of research output and innovations. Research activity on the continent will neither be sustainable nor impactful unless innovation and their commercialization are not part of endeavour.

Strategies for enhancing research excellence in the African region

The drive for excellence in research is a global phenomenon and in Africa, it is a very urgent issue due to myriads of social-economic challenges that need solutions. In this section, we summarize some of the proposals that have from this systematic literature review on the issue.

i. Promote evidence-based practice in different fields

Current literature provides that evidence-based practice can enhance research and its application in improving decision-making and outcomes of processes in various sectors, including health and education. This includes establishing sound evidence where existing evidence is lacking, questionable, or weak by for example setting up and access to databases of relevant research findings and best practices.

ii. Improving human capacity for quality of research

The question of quality revolves around issues of technical accuracy, relevance, and applicability of research. These questions are critical because they determine the level of funding to research on the continent by global partners as well the extent to which national governments are persuaded to increase investments in the national research systems

Improving the quality of research ensures that, practice and policy are based on research that meets the criteria of scientific validity. Among key measures required is to develop and equip African researchers to deliver quality research (African research and Impact Network (ARIN), 2020; AESA, 2021). According to AAS, (2021) improvement of capacity should also include institutional leadership (strengthening research management functions), sustainability (financial and career sustainability, standards (common standards and good practice that constitute acceptable levels of delivery), and developing the individual capacity of research management staff (career professionalism in research management).

Efforts to improve research skills should include training university students in qualitative research including the techniques of critical and analytical thinking, evaluating arguments and conclusions as

well as originality, and academic integrity. Higher education institutions also should put in place training programs to ensure that students and young researchers are well trained to publish studies that meet the highest standards of scientific rigor. Particularly teaching of research methodology at postgraduate level should be expanded to enable students to not only understand the concepts, acquire the research skills but also put them into practice through academic publishing and innovation.

iii. Cultivate close collaboration between research stakeholders

To achieve relevance research in Africa should target real gaps in the community by carefully considering questions that need to be investigated in what contexts and for what practical ends. A close collaboration between researchers and the community will assist researchers to understand the real problems that need to be investigated increase the awareness of the local community of the objectives of the research and being ready to embrace the outcomes. On the other hand, researchers will undertake research that addresses local problems, thereby preparing the ground for quick uptake of results.

The role of research in the creation of credible policies is widely acknowledged and there has been a persistent call for closer collaboration between researchers and policymakers to ensure that research responds to policy needs (Duiveman, 2020). The shared objective among various stakeholders in Africa such as researchers, policymakers, and practitioners is to find correct answers to the current and emerging problems of communities on the African continent. A lot can be achieved faster if there is a collaboration between these players such in identified the priority relevant research domains as well as relevant policy research issues. This collaboration will arouse more interest, participation, and dialogue with all interested parties. I term policy, it would catalyze more policy review and transform research findings into policy.

iv. Adopt new models of scholarly communication

In order to improve visibility, access and use of African research there is need to review the existing models of scholarly communication on the continent to make them less expensive and convenient. These measures include adoption of open access publishing and access to Africa's research output, establishing digital repositories for storage dissemination and indexing of educational research and developing locally sensitive research metrics for evaluation of African research.

v. Improved access to the scientific literature

Easy access to high-quality research information content is a key foundation for good research. Therefore need to build high-value library collections, use library resources, and improve our information retrieval skills.

This will ensure future research, practice, and policy is based on educational research that meets the criteria of scientific validity. Lately library consortia such as Kenya Libraries and Information Services Consortium (KLISC) have emerged across the continent to promote access to research information by negotiating for better licensing terms with global publishers, implementation of open access publishing, and information literacy among the various stakeholders in the research endeavour.

Conclusion and Recommendations

Research excellence is a pertinent factor in achieving sustainable development. It is therefore an issue that researchers, practitioners, and policymakers in Africa need to address if research activities are to help in solving the myriad problems facing the continent. This paper has identified several challenges facing African research such as low levels of output and quality in research, low visibility and access to African research, foreign control research agenda,

poor research infrastructure, and low intra-Africa research collaboration, and low impact of research on policy, practice, and innovation. These create room for improvement of research excellence in the African region in terms of relevance, sufficiency, application.

The paper proposes that to improve the relevance and impact of research in African on sustainable development there is a need to promote evidence-based practice in different fields, cultivating a closer collaboration between research stakeholders and local communities where we do research, improving human capacity for quality of research, interrogation of the policy-making process by researchers, and a review of the current models of scholarly communication on the continent with the view to improve dissemination and access to African research and thus improved visibility.

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