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Making Uganda the Best: Leveraging Research for Economic Leapfrog and Societal transformation

Steven Sebbale, Martin Ongol, Noelline Basiime, Ismail Baruhagara, Patrick Mafabi, Immaculate Nakamya, Jacob Komakech

Summary

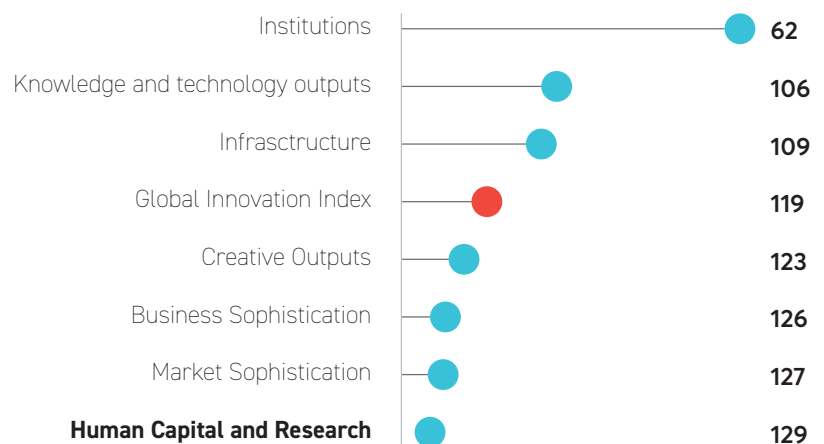
Science, Technology and Innovation (STI) are expected to play a catalytic role in Uganda's socio-economic transformation. Climate change, high youth unemployment and other spontaneous calamitous events like pandemics and wars are not only causing global economic stagnation but also straining the growth aspirations of emerging economies like Uganda. Whereas its role as a primary response to these challenges is broadly acknowledged, research remains on the fringes of the policy debate in Uganda. This National Research Outlook Report, aims at placing a sharp focus on Uganda's research system including the challenges, gaps and opportunities. The Report shows that research and innovation can drive Uganda's accelerated growth if the existing structural gaps within the research ecosystem are resolved. New mechanisms and incentives should be put in place to facilitate research-led sustainable development and accelerate Uganda's transformation towards middle-income status.

¹ As defined by the OECD OSLO Manual: Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications

Introduction

Uganda's economy has continued to impress over the post-COVID-19 recovery period with GDP growth expected to recover to 5.7% during FY23 and economic growth expected to accelerate to above 6% per year in the medium-term (World Bank, 2023). It is anticipated that investments and exports of oil will support the government's other promotion efforts for tourism, export diversification and agro-industrialization. However, several global indicators have consistently shown that Uganda remains on the back-foot in terms of knowledge generation and research. Whereas Uganda's Vision 2040 aims to transform Ugandan society from a predominantly peasant and low-income society into a competitive upper-middle-income country within 30 years, the indicators tell a different story. The 2022 Global Innovation Index (GII) shows that Uganda ranked 129 out of 133 countries with regard to Human Capital and Research (WIPO, 2022). The countries performing well across these indicators have increased their R&D expenditure in some of the high-growth sectors like ICT hardware and electrical equipment; Software and ICT services; Pharmaceuticals and biotechnology; and, Construction and industrial metals.

The Seven GII Pillar ranks for Uganda (2022)



The Research Ecosystem

Uganda's Research system has been on an expansive path. Beginning in 1970 with the establishment of the National Research Council (NRC), the potential contribution of research framed Uganda's post-independence development roadmap. The establishment of the Uganda National Council for Science and Technology (UNCST) as the national research coordinating agency in 1990 further strengthened the notion of its primacy in sustainable national development. Successive government documents, including the National Development Plan, the Vision 2040 and the Sustainable Development Goals (SDGs) have shown that research provides the necessary input for much needed policy reform in the different aspects of national transformation (Fayomi, et al 2018).

Intersectionality of the issues shaping Uganda's Research Ecosystem



The number of research registered at the UNCST has continued to grow over the past thirty years. Part of this growth can be attributed to the establishment of a robust research quality assurance system, a liberalised higher education system and increased research collaboration activity. According to SJR, research by authors from Uganda was published across 1,211 journals, an increase of 30% over the last five years. To emerge from the downturn and put countries back on a path to sustainable growth, continuous innovation will be required. Response to the COVID-19 pandemic in Uganda was undertaken

using research. For instance, research laboratories in the School of Biomedical Sciences made significant contributions to the national response to the pandemic. Research funding from government and international funders increased during this period with UGX12.1bn given to one research unit to contribute to a series of preventative and analytical COVID-19 studies. Similar funding led to the generation of the first full genomes of SARS-CoV-2 in Uganda and supported the procurement of diagnostic reagents for 10,000 preliminary tests. Several interventions were developed by researchers to mitigate the spread of COVID-19 across different universities. For instance, at Mbarara University of Science and Technology (MUST), a COVIDEX innovation was developed while COVILYCE-1, a recipe of eight different herbs was formulated at Gulu University. Researchers in academia took advantage of the lull in face-to-face teaching to increase their research output. For instance, research publications from Makerere University rose by 31% from 992 papers in 2019 to 1,301 in 2020 respectively, while Kampala International University produced over 40 publications on COVID-19 in 2020 and 2021. The increased production rate of PhD degrees (120 per annum) however remains inadequate to influence social impact though knowledge generation and transfer. Translating research to commercialisable products remains a challenge while functional linkages between academia and industry are still inadequate. Whereas interventions like the Science Granting Councils Initiative (SGCI) have supported commercializing of research products in the medium term, several gaps still persist. A heavy reliance of foreign funding for research has further limited the potential impact of research. How research institutions quickly build capacity to transform research into innovative products ultimately determines the national level of competitiveness (Kot, 2020).

What the Research Outlook Report Says

- Uganda's research eco-system is on an expansive growth path. Although research undertaken by business entities and small and medium-sized firms (SMEs) is yet to grow, the role and contribution of scientific research is increasingly becoming visible.
- The role of international research collaboration is inevitable owing to the nature of challenges, including climate change, pandemics, migration, green energy options, etc. However, Uganda has not effectively leveraged research collaboration through practical science diplomacy to strengthen outcomes and sustainably build local capacity.

- Government investment in R&D has been increasing although not commiserate to global trends. For instance, Government budget allocations for R&D budget allocation for R&D between FY 2015/16 and FY 2020/21 increased by 3.5%. Even then, government funding towards research remains less than a quarter of a percent of GDP (0.23%).

- The move towards commercialization of research products is still a challenge. New initiatives, including the latest STI sector posture on Value Chains for value addition and product commercialization can provide a much-needed boost of last-mile support towards research for impact.

- Uganda's research talent is on the rise and research is becoming a primary mandate of many universities. Increasingly, the average national PhD production has gone up by 32%. However, the vagaries of brain drain and brain circulation will persist if no research talent management reforms are undertaken.

- Research governance systems can assure the public of the safety, efficacy and quality of research while mitigating any risks that can arise. A key challenge with especially radical or disruptive innovations is their impact on business models, value chains and markets (Mugwagwa & Banda, 2018). Whereas Uganda has built an internationally recognized robust research quality assurance system, the governance of research should strengthen inter-institutional collaboration and coordination for all research actors and enhance the regulation of all aspects of STI.

- Subsequent global indicators have categorized Uganda as being technologically unready or technologically marginalized. New efforts towards strengthening innovation, building research and incubation infrastructure; and enhancing the Intellectual property (IP) regime should enhance Uganda's capabilities for technology adoption and diffusion.

- Efforts towards new science reforms, including open science can re-posture Uganda's science-led development roadmap. Building systems that are congruent with international best practice but that speak to the local research landscape will be critical.

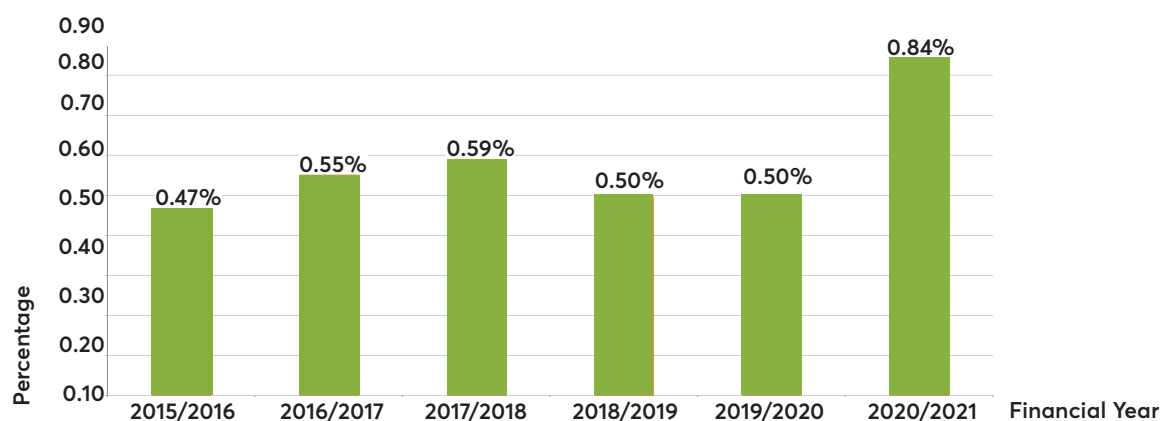
Conclusions

- Uganda research system is still growing and has the potential to grow faster. The primary ingredients for a good research system are in place. What is required is how to sustainably support them to deliver the social impact that Ugandans demand.

- The funding landscape is still having a foreign posture although government has been intentional towards supporting research for commercialisation. New financing options in the private sector, including venture capital can accelerate progress in some of the slow growth sectors.

- Linking research to social impact is still weak. Research translation, commercialization and product development remain the Achilles heel of Uganda's nascent system. The poor consolidation of the research system results into many lost opportunities that limit the level of traction on the research-market pathway. Capitalizing on Uganda's STI Value Chain

Budget Allocations for Research and Development, 2016-2022



Source: Author's Compilation

approach can narrow the gap from “research-bench” to “market-stall”. Regulatory reforms will be vital in providing the best chance for research product commercialization.

- The talent pool for research is the most critical input for any research system. Uganda is losing a lot of research talent annually. The global movement towards brain circulation rather than brain drain, demands that Uganda supports (and protects) its research talent through deliberate human capital policy reviews and talent-retention reforms.

Recommendations

- With Uganda’s vision to achieve middle-income status by 2030, the role of research cannot be overstated. However, reforms on how research is managed, financed and networked will be critical to ensure that the system leverages on the opportunities for inclusive, sustainable and scalable growth.

- Uganda’s import-substitution strategy must be built on a strong research base. Facilitating and supporting research product commercialization and building systems on quality assurance can open up new markets for Uganda’s research products. This will be critical as the country participates in increasingly competitive regional and global markets.

- The need to explore new and sustainable funding options is critical. Venture Capital (VC) financing for research is one of the new areas where Africa has had the strongest growth. Uganda is yet to tap into VC-financing towards research and innovation. Changing the research financing options can recalibrate research impact on social change.

- The criticality of international collaboration remains a key element of the Uganda’s research ecosystem. Building systems around Science Diplomacy and supporting collaboration on common challenges is a necessity. The mainstreaming of regularized collaboration and support of win/win research partnerships can have lasting impact.

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