

A Regional Approach to Addressing SDGs: Postgraduate Education and Research in Africa

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Abstract

While the task of addressing the Sustainable Development Goals is of global importance, it is frequently in low- and middle-income countries that the challenge is most pronounced. In many cases, these countries do not have the resources – financial, sectoral and human – in place to comprehensively tackle all of the SDGs. In these developing economies, universities are tasked with educating a rapidly growing number of undergraduate students, training postgraduate students who will have the skills to contribute across the economy, and also generating the academic research necessary to achieve the SDGs.

The challenge for universities is perhaps most pronounced in sub-Saharan Africa. Universities frequently struggle with high student/teacher ratios, the number of postgraduate students (especially in STEM disciplines) is limited, and historically the region does not produce enough academic research compared to other parts of the world. And at the same time, it is perhaps in this region that universities will be relied upon most in the coming years to provide both the human capital and the knowledge base for development.

In this paper, we look at how national and regional strategies are being employed in sub-Saharan Africa to systematically use the higher education sector to address the SDGs. Our approach is two-fold. First, we investigate how national development plans, coupled with regional agendas, focus on SDGs. As part of this, we report on the higher education sector strategies, and in particular the integration with Ministries focused on thematic sectors. And second, we focus on the universities in the region, and how they – both through formal strategies as well as new academic programs focused on SDGs – are training students to address the skills gap, and producing a growing body of applied research that is relevant to the needs of the region.

African universities effectively tackling SDGs require not just strategies and new programs, but also the financial resources to implement these activities and conduct research. Given the scope of the SDGs, partnerships – with private sector stakeholders both national and international, with appropriate Ministries and public utilities, and with leading researchers (regional and global) – are essential.

Introduction

In 2015, the Sustainable Development Goals (SDGs) were agreed to by the United Nations General Assembly¹, with an ambitious timeframe of 15 years – until 2030 – for them to be achieved. The SDGs are broad based in scope, and policymakers have identified 169 Targets, and over 200 Indicators, as a way of measuring global progress towards meeting the goals. And while there are specific goals, targets and indicators that have been developed, it has always been apparent that these identified markers will not be achieved in isolation, but rather progress in one area is a necessary step in achieving progress elsewhere.

The SDGs are ambitious, and while many will focus on “sustainable”, and others will focus on “development”, there is an underlying requirement to focus on the “global” scope of the SDGs. Yet even within this global scope, there are strong variations in starting points for different nations for each of the SDGs, and thus addressing each element in each country will necessarily involve different considerations. Even considering this baseline, it is also evident that while a particular intervention may occur in a local context, there is a need to scale successful smaller interventions more broadly. In addition, it is important to develop large scale activities that can have an impact beyond a local community, and on a national, regional or global scale.

Given the global needs and impacts associated with the SDGs, a systematic, coordinated and integrated approach is necessary to achieve the goals by 2030. The SDGs are not solely focused on the developing economies of the world, but will require actions by all countries. And yet, the scale of the SDGs also presents one of the biggest challenges. For any action to have a long-term benefit, a broad range of stakeholders must work together, and a critical action is to ensure that these stakeholders agree on a path over an extended time frame. Furthermore, communication between the stakeholders must be continuous.

Stakeholders can include policymakers – at the global, regional, national and local levels. Any yet policy is not sufficient; any policy must be implemented - again at all levels - and often through a combination of the public sector, private enterprise and civil society. Financing for policy actions must be made available. Safeguards, and those trained to ensure they are adhered to, must be in place. Underlying all of these elements should be two essential components. First, the necessary research that provides the evidence for policy interventions must be undertaken, and this research must continue through the implementation and evaluation phase. Second, there must be appropriate training – including at higher levels such as postgraduate degrees – to ensure that people with the necessary skills are available globally to support the SDGs.

Education – through SDG 4 – is rightly recognized as an independent SDG. Ensuring access to education, in particular at the basic and secondary level, is a key goal. And globally, as students complete secondary schooling, there will be a growing demand for tertiary education – public and private – for qualified students.

¹ “Sustainable Development Goals Knowledge Platform,” United Nations, accessed July 20 2019, <https://sustainabledevelopment.un.org/>.

The focus of this work is on the role of the higher education sector in addressing SDGs. We choose to go beyond the issues associated with access and equity for higher education at the undergraduate level. Instead, we look at the role of postgraduate education, including student training and research. In particular, we consider the case of Sub-Saharan Africa, where developing economies in sub-Saharan Africa are working to address the SDGs at the same time as building a growing university sector positioned to serve both students and the national/regional agenda.

The Regional Focus in Sub-Saharan Africa

In parallel with the development of the SDGs through a global process, the African Union in 2015 released Agenda 2063: The Africa We Want². While many of the goals not surprisingly align with the SDGs, Agenda 2063 reflects a uniquely African perspective. Aspiration 1 for Africa is “A prosperous Africa based on inclusive growth and sustainable development”, and both the AU and many national development plans directly support this position. The amplification of Aspiration 1 directly ties investments in higher education to the provision of basic services such as health, nutrition, education, shelter, water and sanitation. The Agenda calls explicitly for investments in human capital, including higher education. Furthermore, it highlights the role of postgraduate education “...to ensure world-class infrastructure for learning and research and support [of] scientific reforms that underpin the transformation of the continent...”³. Coupled with a call for investments in science, technology, research and innovation, the Agenda 2063 makes a clear call for a strong pan-African investment in postgraduate education to support both the political agenda and the continent-wide development path. Critically, the Agenda 2063 also focuses on partnering across Africa and on seeking regional networks, and not relying solely on national interests to address continental challenges.

In addition to Agenda 2063, the Science, Technology and Innovation Strategy for Africa (STISA-2024) provides a focused structure for STI development, including that of higher education⁴. STISA-2024 has four pillars that are essential to capitalizing on the higher education sector to advance Africa development in alignment with the SDGs: “building and/or upgrading research infrastructures; enhancing professional and technical competencies; promoting entrepreneurship and innovation; and providing an enabling environment for STI development in the African continent.”

While the global and continental agendas are essential, nations too must identify national priorities, especially as resources are inevitably constrained. Ghana recently released a long-term, 40 year National Development Plan that is designed to achieve a “just, free and prosperous” society⁵. The Plan, developed through a broad consultative process, is designed to supersede short term agendas and to provide successive governments with the flexibility necessary to implement policy initiatives tied to the achievement of the long

² “African Union Agenda 2063,” African Union, accessed July 20 2019, <https://au.int/agenda2063>.

³ African Union Agenda 2063,” African Union, accessed July 20 2019, <https://www.un.org/en/africa/osaa/odf/au/agenda2063.pdf>.

⁴ “Science, Technology and Innovation Strategy for Africa 2024,” African Union, accessed July 20 2019, https://au.int/sites/default/files/newsevents/workingdocuments/33178-wd-stisa-english_-_final.pdf.

⁵ “Long-term National Development Plan for Ghana (2018-2057),” NDPC Ghana, accessed July 20 2019, <https://www.cabri-sbo.org/en/documents/long-term-national-development-plan-for-ghana-2018-2057>.

term themes. The NDP also builds on the global SDGs, and explicitly maps the national goals onto specific SDGs. Of particular note to this paper is that the NDP explicitly highlights the role of Higher Education in achieving the broader societal goals. As Ghana seeks to expand access to higher education, research and postgraduate training is also a key sector to inform national development.

Higher Education and the SDGs

Given the primary role of research in the worldwide academic enterprise, it is perhaps obvious that higher education has an important role to play in achieving the SDGs. Globally, the higher education sector has sought to claim this mantle, and several statements and initiatives reflect this.

Recently, The Global Alliance – a partnership of several worldwide university networks including the Association of Commonwealth Universities (ACU), the International Association of Universities (IAU), and the Agence Universitaire de la Francophonie (AUF) – endorsed the SDG Accord at the 2019 United Nations High Level Political Forum⁶. These networks have an impressive array of member institutions worldwide – both in leading research intensive countries and in developing countries. The SDG Accord seeks to obtain university institutional and leadership support for addressing the SDGs. However, to this point its impact in driving progress towards the SDGs has been limited.

While not directly focused on the SDGs, the newly formed U7+ alliance of universities has committed to aligning activities with the G7 agenda⁷. The U7+ includes leading institutions from G7 nations plus other selected universities. These universities will partner in interdisciplinary research and learning, and on addressing environmental concerns such as climate change, biodiversity and energy. In addition, they will work together to focus on equality and inclusiveness.

There are several challenges that emerge when considering the role of university alliances in addressing SDGs. While it is clear that institutional leadership has a key role in identifying institutional priorities, it remains the purview of academics – faculty members, research staff and (post)graduate students – to actually undertake the research activities and translate academic research into action. Likewise, while academic partnerships are often formalized at the institutional level, it is clear that the most effective partnerships are driven by the faculty members/researchers themselves, and this is especially important for international collaborations. Thus, institutional commitments may not always result in actual progress towards SDGs.

In a similar vein, it may be argued that the mindset for the SDGs is “development”, and in many cases the focus is on the developing world. For many academic researchers, the typical mindset is focused on the quest for knowledge, or to drive progress. While

⁶ “The SDG Accord: The University and College Sector’s Collective Response to the Global Goals,” The Global Alliance, accessed July 20 2019, https://www.sustainabilityexchange.ac.uk/ckfiles/2019_the_sdg_accord_un_high_political_forum_final_online_version.pdf.

⁷ “2019 U7+ Presidential Declaration,” U7+ Alliance, accessed July 20 2019, https://www.u7alliance.org/wp-content/uploads/2019/07/U7_2019_FINAL_DECLARATION.pdf.

these concepts may not be disparate, it is not a given that they always align. Likewise, it is not readily apparent that research focused on topics aligned with the SDGs is the same as research focused on addressing the SDGs. In this context, the thematic priorities of some leading funding agencies may have only a tangential relationship to addressing the specific challenges (for the same themes) inherent in achieving the SDGs.

Despite these issues, however, it is apparent that in another critical role the global higher education sector does serve development, and does serve the SDGs. In particular, postgraduate education trains students with expertise in essential thematic areas, and with the ability to identify, address and solve problems. Beyond research results, it is these graduates who will translate knowledge from the university to other essential realms such as policy, finance and implementation. These graduates provide an essential bridge from the university to broader society as it accelerates sustainable development and tackles the SDGs.

There is another driver that has the potential to push universities and academic researchers to focus on the SDGs (as well as other themes deemed important). Globally, there is a growing expectation that public investment – whether in infrastructure, people, policies or other activities – demonstrates “value” for society. From a training perspective, this may mean that graduates should be equipped with more “in-demand” skills for specific economic/industry needs or future careers. Academic research activities should have a potential “broader impact” in the parlance of the US National Science Foundation⁸. The current push globally for “open access” and “open science” – especially for research supported from public funds - is due in part to the hope and expectation that research results will be commercialized or otherwise valorized for society.

While much of the above discussion focuses on universities in high income countries, many of the issues apply similarly to those institutions in Africa. In the immediate post-independence era, university systems in sub-Saharan countries were small – both in terms of number of universities and in terms of enrollment. Beyond that, there was an immediate tension between the view of many governments to see universities as a key driver of national development, and the traditional academic view of an institution driven by learning and intellectual curiosity. Institutional (and faculty) autonomy was in conflict with (extremely) limited resources and governments eager to see a return on its investment. Coupled with this was the widespread weakness of the sector in sub-Saharan Africa in so-called STEM (science, technology, engineering and mathematics) disciplines that are often considered the foundation of economic development and prosperity.

Throughout sub-Saharan Africa, the higher education sector has grown substantially in recent years. The number of public universities has grown substantially, and many of these institutions are focused on disciplines associated with national development agendas. Likewise, enrollments have grown dramatically, with many flagship universities seeing rapid increases in enrollment over the past twenty years (according

⁸ “Revised NSF Merit Review Criteria,” US National Science Foundation, accessed July 20 2019, https://www.nsf.gov/bfa/dias/policy/merit_review/overview.pdf.

to the Herana project⁹, the University of Ghana has average 9.4% growth from 2001 – 2016), with over 40,000 students now enrolled). However, the vast majority of public university students are enrolled at the undergraduate level, with more limited increases in Masters' level students and PhD students (again, at the University of Ghana, the increase in PhD students is from 67 to 671 over 15 years). This percentage of PhD students lags with typical numbers at flagship universities in research-intensive countries. The number of faculty members has not grown commensurately with enrollments, and the (undergraduate) teaching loads limit the time available for postgraduate mentoring and academic research.

Addressing SDGs through Academic Research in Africa

Although the numbers remain relatively low compared to other regions of the world, there is a renewed focus on postgraduate education and academic research in sub-Saharan Africa. One significant constraint to academic research is the limited availability of competitive research funding that is managed either at the national or regional level. Especially in the STEM related disciplines that are an (but definitely not the only) essential component of addressing the SDGs, the limited funding hinders research endeavors that rely upon significant research infrastructure and supplies to undertake the research.

Perhaps most importantly, the limited availability of research funding has a strong influence on the people – faculty members, research staff and postgraduate students – necessary to conduct research. Potential postgraduate students may see greater funding (including scholarships and fellowships) in Europe or North America for the studies. Potential faculty members may see greater potential access to research funding agencies if they are based outside Africa (although success rates for research proposals are extremely low in many research intensive countries).

Despite these challenges, Africa – working independently and with various partners - is moving to address these issues in a systematic way at both the national and regional level. While much of the focus on higher education funding is on access and capacity building at the undergraduate level, there are several research and policy initiatives that are having a demonstrable impact on the research output in Africa. And many of these initiatives are explicitly putting development-focused research, and the SDGs, at the forefront of their mission.

A significant portion of research funding in Africa is available through development agencies and global research funding agencies. Calls for proposals may be issued by the funder, and in some cases the funding that flows to African institutions and researchers is intrinsically linked to a university or research institution in the country that provides the funding.

In 2015, the UK Government announced a £1.5 billion initiative as part of its Official Development Assistance (ODA) target. The Global Challenges Research Fund (GCRF) is implemented through various UK partners, and supports research and academic capacity building in developing countries, partnerships with UK universities and

⁹ Cloete, Nico, Ian Bunting and Francois van Schalkwyk. *Research Universities in Africa*. Cape Town, South Africa: African Minds, 2018.

researchers, all with a focus on development challenges ¹⁰. Many other countries, including France and Germany, have a similar focus with Calls for Proposals and other activities focused on (1) strengthening African research capacity and performance, and (2) supporting research targeted at addressing the development objectives including the SDGs.

In general, leading global research funding agencies are nationally-based and focused on national research agendas. Typically, while international partnerships are encouraged, the expectation is that each partner (for example in the US and in Africa) must have nationally-based funding to support the collaboration. Given the limited national resources available in Africa, this limits collaboration opportunities. Despite these challenges, a reasonable range of collaborations have developed although Africa-based funding is frequently limited compared to the international partner. Again, given the typical mismatch in funding, the research agenda – even if focused on development topics or even the SDGs, is driven by the international partner. Furthermore, there is little coordination between the global research funding agencies in partnering with leading African researchers; this has the potential to lead to inefficiencies in advancing the global research enterprise.

While global research partnerships are essential, and the international funding is welcome, there is a strong need to strengthen the ownership of research conducted in Africa, by Africa institutions, and by African researchers. Several recent initiatives have provided Africa with stronger ownership of the research enterprise on the continent. These regional initiatives, often with the support of the global research community, focus both on research and postgraduate training, and on research management capacity building to support the research enterprise. Consequently, there is a growing regional capacity to train African students in Africa, to encourage African researchers to pursue careers in Africa, and to enable African higher education to address Africa-focused research questions at the heart of, for example, the SDGs.

The Pan-African University (PAU) project is an African Union led initiative to establish regional university hubs – coupled with pan-African networks – in priority thematic areas. The PAU establishes particular postgraduate programs and research agendas at campuses distributed across Africa. By building capacity in a regional manner, the PAU can reduce duplication, focus resources in targeted areas, and provide African students with a focal point for studies in particular disciplines. The PAU priority areas align closely with the SDGs.

The Developing Excellence in Leadership, Training and Science) DELTAS Africa initiative supports excellence in life sciences research across sub-Saharan Africa ¹¹. While funding comes through the Wellcome Trust and DFID (UK), the management of the program is located at the African Academy of Sciences. This structure ensures African ownership and capacity building. The project itself supports leading African

¹⁰ “Global Challenges Research Fund,” UK Research and Innovation (UKRI), accessed July 20 2019, <https://www.ukri.org/research/global-challenges-research-fund/>.

¹¹ “DELTAS Africa,” African Academy of Sciences, accessed July 20 2019, <https://www.aesa.aasciences.ac.ke/academy/academy-pages/developing-excellence-in-leadership-training-and-science-deltas-africa-initiative/>.

researchers and institutions, and again brings together hub institutions with a wider African network to strengthen the regional research enterprise systematically.

Since 2014, the World Bank has supported three iterations of the Africa Centers of Excellence (ACE) projects. Over 60 Centers of Excellence have been supported in almost 20 countries. The ACE projects are regional in scope, and each Center addresses a particular development challenge (again, typically mapped to one of the SDGs). Although each Center is supported nationally through World Bank financing, they are part of a regional portfolio of Centers that serve as regional hubs in their thematic focus area. As part of their mission, Centers are required to recruit and train regional students, and engage in partnerships with regional “spokes” that can contribute to the academic missions.

Two further regional African-led initiatives are focused on support for individual African researchers (faculty and students) to address Africa-focused research questions. The Regional Scholarship and Innovation Fund (RSIF) supports postgraduate students from participating African countries to pursue PhDs at ACE Centers¹². Successful student applicants are expected to focus their studies in thematic areas crucial to African development. While not yet operational, the long-planned African Research Council (similar to the European Research Council supported by the European Commission) promises to support elite researchers across the continent – furthering African research capacity and strengthening postgraduate training opportunities.

Globally, all leading research performing countries benefit from a strong research funding organization committed to supporting research identified through a competitive selection process. In addition to the African continental and regional initiatives, an essential, long-term component of the African research support system must be sustainable, well-funded, national research councils. The Science Granting Councils Initiative (SGCI), supported by IDRC (Canada), DFID (UK) and the National Research Foundation (South Africa), supports 15 emerging research councils across sub-Saharan Africa¹³. The focus of the initiative is building up the research management capacity of national funding agencies, with the anticipated benefits of stronger national research systems and partnerships to support nationally driven, but regionally implemented, research collaborations.

A related initiative is the Alliance for Accelerating Excellence for Science in Africa (AESA), which is led by the African Academy of Sciences and NEPAD with support from the Wellcome Trust, the Gates Foundation and DFID. AESA supports a broad range of activities, including a Grand Challenges Africa fund focused on SDGs, a Good Financial Grant Practice activity, and the Research Management Program (ReMPro) Africa program. Many of the AESA initiatives are focused on building institutional research management capacity, with the goal of enabling faculty members to focus on research rather than administrative concerns¹⁴.

¹² “The Regional Scholarship and Innovation Fund,” Partnership for Applied Science and Technology, accessed July 20 2019, <https://www.rsif-paset.org/calls/scholarships-call/>.

¹³ Science Granting Councils Initiative, “SGCI, accessed July 20 2019, <https://sgciafrica.org/en-za/home>.

¹⁴ “The Alliance for Accelerating Excellence for Science in Africa, African Academy of Sciences, accessed July 20 2019, <https://aasciences.ac.ke/aesa>.

National Alignment of University Strategies with the SDGs

As discussed previously, universities must balance intellectual curiosity and academic freedom with national priorities and being a public asset. This balance is especially important in the research mission of the university. While nations may have a national development plan, and in many cases incorporate higher education as a key component, institutions develop Strategic Plans that can provide direction for the university not just in terms of practices and operations but also in terms of research priorities. In this section, we discuss two institutions that have explicitly tied their research agendas to national priorities and the SDGs.

The University of Rwanda, in its UR7 2018-2025 Strategic Plan, identifies Goal 1 as to be a Research-led University¹⁵. The Plan identifies areas of existing excellence (as measured, for example, by international, competitive research funding), but further emphasizes interdisciplinary research and partnerships. Paragraph 2.1.2 notes that UR will “Prioritise research areas that advance the University as an internationally recognized University”, with a focus on “challenges to the nation and the continent of Africa.....[and] consolidate global initiatives such as the Sustainable Development Goals”. As the only public university in Rwanda, UR is therefore directly tying its research activities to national development, and furthermore it commits to disseminating its research in support of this agenda. This linkage between the academy and government provides a clear opportunity to undertake demand driven research in support of evidence-based pursuit of the SDGs.

The 2014-2018 Copperbelt University (Zambia) Strategic Plan was closely tied with the government’s Vision 2030¹⁶ and the 6th National Development Plan. Located in a region heavily dependent on mining, both the Strategic Plan and the national policy documents focus on research necessary for reducing the environmental degradation associated with mining. A Center of Excellence on Sustainable Mining is one example of this synergy, where university investments align with a broader national goal and the SDGs. Beyond that, Copperbelt University explicitly ties its research activities with the broader regional need of minimizing the environmental footprint of large-scale mining endeavors.

Summary

This paper focuses on the role of postgraduate training and applied research in addressing the SDGs. Starting from a global perspective for higher education, we report on how Africa – at the regional and the national levels – is implementing programs and initiatives to support a growing research enterprise, and linking these activities with policy makers across the continent. We find that in an emerging research landscape with limited resources, regional cooperation provides the opportunity to strengthen clusters of excellence for the benefit not just of one country but the region as a whole. A key challenge is the long-term sustainability of the emerging research ecosystem.

¹⁵ “University of Rwanda 2018-2025 Strategic Plan,” University of Rwanda, accessed July 20 2019, <https://ur.ac.rw/documents/UR%202018-2025%20Strategic%20Plan-.pdf>.

¹⁶ “Vision 2030,” Government of Zambia, accessed July 20 2019, <http://unpan1.un.org/intradoc/groups/public/documents/cpsi/unpan040333.pdf>.

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