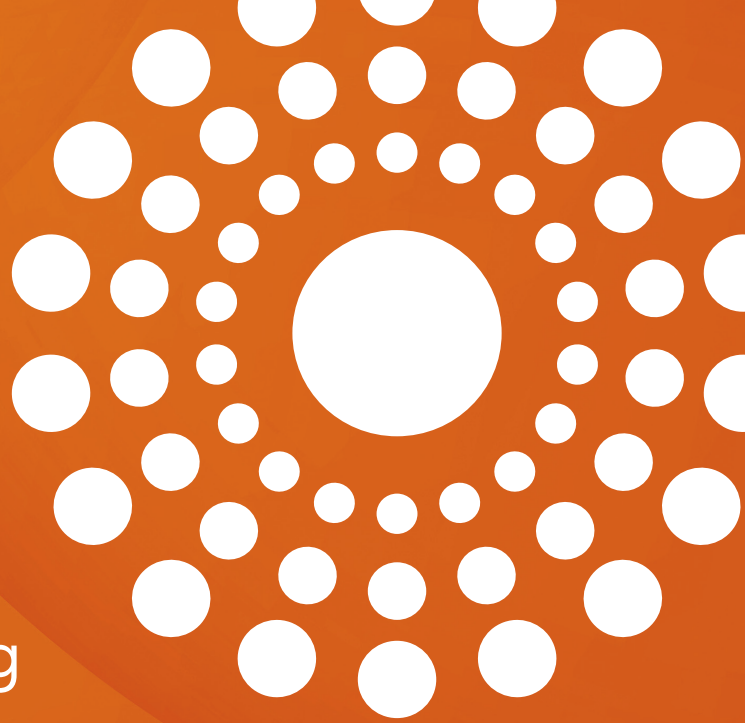


Carnegie African
Diaspora Fellowship
Program Alumni Convening

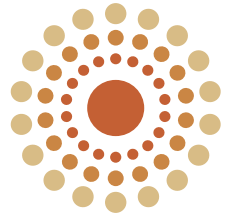


A Vision for the Future

Policy Implications for Higher Education
in Africa: Models for Engaging the
Academic Diaspora



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Policy Implications for Higher Education
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Students with Disabilities in Higher Education in Africa: Trends, Challenges, and Practical Strategies for Inclusion

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ABSTRACT

Over 90% of children with disabilities in low- and middle-income countries do not attend school. In sub-Saharan Africa, less than one percent of students with disabilities (SWDs) have access to higher education. Although there is a gradual increase in the numbers of SWDs in higher institutions worldwide, these numbers are relatively small in low- and middle-income countries, which account for 80% of the world's population of persons with disabilities (PWDs). Endemic poverty, unfavorable home situations, lack of trained teachers, absence of political will, and limited access to instructional resources during the formative years, among other factors, often result in SWDs' inadequate preparation for higher education. Once admitted, SWDs face multiple architectural barriers, inappropriate curricula, negative attitudes of lecturers, social isolation, etc. The objectives of this presentation are to highlight the trends and challenges for more equitable and sustainable inclusion of SWDs in tertiary education in Africa, and to discuss practical strategies African scholars can implement in their home countries to improve the status quo.

Introduction

In general terms, education can be described as an instrument for national development and social change designed to maximize the creative potentials and skills of the individual for self-fulfillment and overall development of the society. In this context, one of the goals of education should be the development of appropriate skills; mental, physical, and social abilities; and competencies to empower an individual to live in and contribute positively to the society. This implies that education must be compulsory and seen as the right of every child regardless of gender, social status, religion, ethnicity, background, disability, and any particular individual challenges. In this paper, the focus is on higher (tertiary) education—that is, the education given after secondary education. The goal is to describe how such education can contribute to national development through high-level personnel training, promote and encourage scholarship, advance national and international understanding, and provide accessible and affordable quality learning opportunities in response to needs and interests of all African children, including those with disabilities.

Background Information

According to UNESCO (2020), approximately 15% of the world's population of 7.7 billion (U.S. Department of Commerce, 2021) comprises persons with disabilities (PWDs). In numerical terms, this translates into 1.1 billion PWDs worldwide. Worldometers.info (2022) estimates Africa's population to be nearly 1.39 billion people, of which about 208 million are PWDs. This percentage increases in communities and nations due to a variety of factors, including but not limited to: chronic poverty, congenital abnormalities, illnesses, inefficient assessment

procedures, road and industrial accidents, wars, natural disasters, environmental toxins, and aging (Ajuwon et al., 2020; Malakpa & Spann, 2012). Given the bleak situation in which PWDs in Africa find themselves, it becomes more daunting for them to benefit from the education system. On many levels, these negative experiences have the potential to exclude PWDs from lifelong formal and informal processes of equipping themselves to be fully aware of their environment and to exploit, manage, and dominate the same for their benefit and for society at large (Hughson & Uditsky, 2007; Obasanjo & Mabogunje, 1991). Yet ample evidence indicates that only a small fraction of the world's population of PWDs—especially those in low- and middle-income countries—attend schools (Kochung, 2011; UNESCO, 2020). The evidence further demonstrates that few students with disabilities (SWDs) attend and/or graduate from institutions of higher education (Belch, 2004; Hill, 1996; Lightner et al., 2012; Orr & Goodman, 2010).

For decades, most African governments have been unable to admit, retain, and graduate SWDs beyond a nominal percentage. This is unconscionable because, aside from providing knowledge, skills and experience, postsecondary education confers additional benefits such as encouraging accessible, lifelong learning as a means of attaining a better future for most young people; satisfying personal goals; allowing for effective competition in the job market; and contributing to independence and financial autonomy (Fichten, 1988; King & Hill, 1993; McMahon, 2009; Mourshed et al., 2013; Ross et al., 2013). These advantages are particularly relevant for PWDs for whom postsecondary education has been described as a crucial link between high school and successful adult life (Fairweather & Shaver, 1990; Hughson & Uditsky, 2007; Milsom & Thompson, 2004; Murugami & Nel, 2012).

The objectives of this paper are twofold: first, to analyze the trends and challenges for more equitable and sustainable inclusion of SWDs in institutions of higher learning in Africa, and second, to discuss practical strategies African scholars in the diaspora can implement to promote effective inclusion in their home countries' higher institutions. In support of the twin objectives, two case studies will be presented to illustrate how SWDs can be empowered or disenfranchised in the pursuit of quality higher education.

Trends in Educating SWDs in Africa

Policies governing educational rights of PWDs at the international level evolved gradually for several decades after the Second World War. Prior to the attainment of independence by most countries in Africa, entitlement to education was first introduced in the 1948 United Nations Universal Declaration of Human Rights (<https://www.un.org/en/about-us/universal-declaration-of-human-rights>). Indeed, for the first time, this historic document validated the fact that everyone has the right to education; that education shall be free and compulsory at least in the elementary and fundamental stages; that technical and professional education shall be made generally available; and higher education shall be equally accessible to all based on merit.

The 1960 UNESCO Convention against Discrimination in Education mandated that countries address barriers in education (1960). Article 1 prohibits unequal treatment in education based on individual differences or characteristics. In the 1989 UN Convention on the Rights of the Child, Article 23 recognized "the special needs of a disabled child," and urges all countries to set up programs to ensure that the child with a disability can access education which will maximize their individual development and social integration (1989).

In 1990, the World Conference on Education for All World Declaration on Education for All, written in Thailand, called for measures to "provide equal access to education to every category of disabled persons as an integral part of the education system" (Article 3). While the right of children with disabilities to receive an education was now recognized, it was not until the 1994 World Congress on Special Needs Education: Access and Equality, held in Salamanca, Spain, that the principle of inclusive education was enunciated. In unambiguous terms, the document asserted that "children and youths with special educational needs should be included in the education arrangements made for the majority of children" (World Congress on Special Needs Education: Access and Equality, 1994). Furthermore, the document urged states to "adopt as a matter of law or policy inclusive education." The principle of inclusive education for children with disabilities was reinforced in 2000 at the World Education Forum held in Dakar, Senegal (United Nations).

In response to global advocacy, the 2006 United Nations Convention on the Rights of Persons with Disabilities and Optional Protocol (UNCRPD) proclaimed in Article 24 the right to inclusive education of all children with disabilities. Its aim is the

development by people with disabilities "...of their personality, talents and creativities as well as their mental and physical abilities to their fullest potential." In reference to higher education, the UNCRPD asserted, "States Parties shall ensure that persons with disabilities are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others. To this end, States Parties shall ensure that reasonable accommodation is provided to persons with disabilities" (Article 24).

Following along the preceding themes, on 25 September 2015, 193 countries of the UN General Assembly adopted the 2030 Development Agenda, entitled Transforming Our World: The 2030 Agenda for Sustainable Development (Agbedahin, 2019; Weiland et al., 2021). It became imperative to adopt the 17 new Sustainable Development Goals (SDGs) as the future global framework to succeed the Millennium Development Goals (MDGs), which ended in 2015 without much to show for the global initiative. In a bid to improve on the shortcomings of the MDGs, Goal 4 of the SDGs aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations General Assembly, 2015).

A major African initiative to promote the education rights of PWDs occurred in 2018. The Protocol to the African Charter on Human and Peoples' Rights on the Rights of Persons with Disabilities in Africa established that "persons with disabilities have the right to education on an equal basis with others" (Article 16) with provision for reasonable accommodation, individualized support, training for professionals, and support for sign languages. Furthermore, the African Charter on the Rights and Welfare of the Child (ACRWC) protects children from discrimination and addresses the right of the child to education (Article 11), as well as the rights of children with disabilities (Article 13).

Based on available records, most African governments have signed and domesticated these international treaties. However, it is a well-known fact that these nations are experiencing formidable challenges that impede effective provision of quality education, particularly to SWDs at all educational levels, thus forcing these governments to jettison their commitment to an important segment of the population. The piecemeal efforts of African governments in the disability sector may well indicate an absence of a clear understanding and conceptualization of the important principles that govern inclusive education practices as seen in the Global North. This has resulted in marginalization and disempowerment of SWDs, especially in higher institutions throughout Africa, as illustrated in the following two case studies.

Why Does Inclusion Matter?

The concept of inclusion has become paramount in disability circles globally. Inclusion implies a way of acknowledging differences to foster a climate of belonging in which people are valued and celebrated for the improvement of our society and the world at large (Ajuwon, 2012). Clearly, the current state

Case Study 1: “Jane Ihuoma Ottah: The Face of Deafness and Discrimination in Nigeria”

Jane Ihuoma Ottah is deaf. She hails from Arochukwu local government in Abia State, Nigeria, but was born and raised in Port Harcourt. On 8 August 1996, at the age of six, she became deaf adventitiously while running errands for her mother. At that age, she was barely post-lingual, given the limited vocabulary of a six-year-old. Jane was expelled from primary school when she went deaf because her teachers lacked the knowledge and skills to instruct her. At the age of 15, she went back to school at Therapeutic Day Care Centre, Abakpa Nike, Enugu, where she resumed as a primary three student. She completed primary school at age 19 and proceeded to Hallel College, Port Harcourt, where the founder awarded her a scholarship from junior secondary until her final year. In her final secondary school examinations, Jane earned seven credits and a distinction—a truly remarkable feat.

Furthermore, Jane scored 205 points in the Joint Matriculation Exam and gained admission to study Educational Foundations at the Rivers State University of Science and Technology in September of 2014 at age 27. However, during the second semester of her 100-level courses, she was “deregistered” at the insistence of the Vice Chancellor, Blessing Didia, based on her deafness. Hitherto, she had been fulfilling expected standards of academic performance to continue with her studies at the university.

Regrettably, the authorities failed to show interest in Jane’s academic progress. She was simply asked to terminate her studies because, according to them, their team of medical personnel found it difficult to communicate with her and the university lacked special communication capabilities (Adémólá-Olátéjú, 2016).

Case Study 2: Dr. Olabode Olajumoke, “Father of Universal Design in Nigeria”

In a 2011 article in the 20 February edition of *The Tribune of Nigeria*, Dr. Olajumoke recalled to a reporter an incident which occurred during his tenure as the Pro-Chancellor and Chairman of the Governing Council of Adekunle Ajasin University in Ondo State, Nigeria. On his way to a council meeting, Dr. Olajumoke saw a young man with physical challenges walking on his hands and dragging his legs as he approached the campus gates. The chancellor stopped to question the young man, who explained that he was a university student who lived off-campus because there was no accessible housing on campus. Dr. Olajumoke took the young man in his car to his office that day, and subsequently donated and supervised the building of male and female accessible hostels on the campus. In explaining his generosity, the chancellor stated, “It is just my belief that one should love his neighbor as one would love oneself and that is what my Bible tells me. In doing all these, I am responding to that Biblical injunction.”

While a senator for Ondo North in the National Assembly, he sponsored a bill in 2011 to require that all public buildings in Nigeria be constructed following accessible design standards. His proactive and revolutionary stance has earned him the title of “Father of Universal Design in Nigeria” (Fasanmi, 2011).

of access to education for PWDs is unacceptable, whichever way one looks at it. We need to understand that provision of inclusive education, accompanied by comprehensive planning, trained personnel, adequate instructional resources, and robust budget, can lead to improvement in academic achievement, social and emotional development, self-esteem, and peer acceptance that will increase diversity in schools, colleges, and universities (Baboo, 2010).

There is empirical evidence in the industrialized world that even including students with intellectual and developmental disabilities in postsecondary education can prevent stereotyping, devaluation, and isolation. In these advanced countries, a number of these students are embracing opportunities to enroll in practical, hands-on programs in postsecondary institutions. For example, Bear POWER (Promoting Opportunities for Work, Education and Resilience) at Missouri State University offers a nondegree program after high school for students with intellectual and developmental disabilities. On completion of their training, the students are ready to find a job compatible with their skills and dreams (<https://www.missouristate.edu/BearPOWER/program-details.htm>).

Beacon College in Florida is an excellent example of a liberal arts institution that strives to be the model educational institution for every individual who struggles with a learning disability. Established in 1989, it is the first college in the country accredited to award bachelor's degrees exclusively to students with learning disabilities, ADHD, dyslexia, and ASD (<https://www.beaconcollege.edu/about-beacon-college/beacon-at-a-glance/mission-statement/>). Thus, in recognition of the exemplary programs at this Florida institution, Aleph Foundation in Nigeria has sought collaboration "to promote the education and training of persons who learn differently and/or with intellectual and developmental disabilities for the purpose of empowerment, social development, economic inclusion and the general well-being of those who support them" (Aleph Foundation, n.d.). The Foundation, which was incorporated on 15 December 2017, aims to actualize its programs of training teachers, parents and students with learning and attention issues (LAI) at primary, secondary, and tertiary levels in Nigeria (O. Daniel, personal communication, 18 August 2021).

Over the years, most African governments have formulated disability-related policies with a substantial element of protection and charity (Ajuwon, 2017; Ross, 1988; Tesemma, 2011), but not with the right to make choices that will empower PWDs and ultimately free them from decisions imposed by professionals (Brown & Faragher, 2014). No one will dispute the salient fact that empowering PWDs in Africa requires a paradigm shift through which various systems of society such as education, training and healthcare services can be deployed seamlessly. But such a shift necessitates the right of PWDs to access the education and social supports they need within the ordinary structures available in each country.

Practical Strategies for Diaspora Scholars to Promote Inclusion of SWDs

Despite a gradual increase in the enrollment of SWDs in postsecondary institutions in Africa (Ajuwon and Akighir (1989); Chiwandire & Vincent, 2019; Duma, 2019; Haastrup, 2015; Walton et al., 2016), there is an absence of concrete action to provide equal opportunities for them. In fact, to any keen observer, tertiary institutions in Africa are not well-prepared to accommodate SWDs in areas of academics, socialization, and practical job readiness skills. These issues frustrate some SWDs, forcing them to drop out of school. In the remaining section of this paper, the author advances some recommendations for improving the status quo. In other words, how can African scholars in the diaspora and international partners become better engaged in advancing inclusive practices in the continent's institutions of higher learning?

1. Develop Scholars' Knowledge and Understanding of Disabilities.

Most African governments have now formulated policies on disability and inclusion in line with signed international treaties. As commonly understood, there are many types of disabilities, of which 55%–85% are invisible or hidden (Izzo & Horne, 2017). Table 1 below lists the major categories of special needs persons as defined in Section 7 of the Federal Republic of Nigeria's National Policy on Education (2014):

TABLE 1

Categories of Special Needs Persons in Nigeria

- a. Visual Impairment (blind and partially sighted)
- b. Hearing impairment (deaf and hard-of-hearing)
- c. Physical and health impairment
- d. Intellectual disability
- e. Emotional and behavioral disorders
- f. Speech and language impairment
- g. Specific learning disabilities
- h. Multiple disabilities
- i. Gifted and talented
- j. Albinism

It is instructive to note that the national policies related to special needs education of most African countries are like the categories shown in Table 1. These categories also largely incorporate salient aspects of UNESCO's landmark special education policies. The classification of disabilities is significant because, in both developed and developing countries, the specific type of disability will shape the interventions (accommodations) required to enable affected students to succeed in education, including at the tertiary level. However, designing effective interventions necessitates developing accurate understanding and knowledge of each disability area.

The United Nations Children's Fund (UNICEF) and the Washington Group on Disability Statistics (2021) recently developed a Child Functioning Module to provide population-level estimates of the number and proportion of children with disabilities aligning with the UNCRPD and a biopsychosocial concept of disability. Current regional estimates for children 0-17 years in Africa are illustrated in Table 2 below (UNICEF, 2021):

TABLE 2

Regional Estimates of Childhood Disability in Africa

REGION	PERCENTAGE OF CHILDREN WITH DISABILITIES	NUMBER OF CHILDREN WITH DISABILITIES (MILLIONS)
Eastern and Southern Africa	10	28.9
Middle East and North Africa	13	20.9
West and Central Africa	15	41.1

The above estimates provide strong evidence of the magnitude of childhood disabilities across the continent. Furthermore, and coupled with the current COVID-19 pandemic situation and the aging population, the data clearly demonstrate the urgent need to provide universal quality education and training (among other essential services) to children with disabilities. These children will comprise a significant proportion of wage-earning adults in their respective countries in the future.

2. Adopt Policies for SWDs to Access Approved Academic Accommodations.

As practiced in high-income countries, SWDs are entitled to specific instructional, assignment, and examination accommodations. Typically, these accommodations guide instructors in the provision of service, and enable SWDs to optimize their learning potential. The accommodations stated in Tables 3 through 5 illustrate practical measures that have been documented in the literature (Burgstahler & Doe, 2006; Debrand & Salzberg, 2005; Hill, 1996; Leyser et al., 1998; Novakovic & Ross, 2015; Patrick & Wessel, 2013; Vasek, 2005), and which diaspora scholars can incorporate into their service engagement in their hosts' institutions.

TABLE 3

Instructional Accommodations

- Allow students to tape record lecture.
- Provide list of textbooks/readings prior to the start of class.
- Provide detailed syllabus/course outline.
- Speak directly to the student (not to the interpreter, human guide, friend, etc.).
- Offer opportunities to meet student to discuss issues/concerns.
- Regularly clarify points that could be misunderstood.
- Arrange for preferential seating, if needed.
- Provide rest breaks in classes longer than 90 minutes.
- Ensure class ends on time to allow travel for next class.
- Arrange for a classmate to take notes.
- Give student photocopies of overheads/lecture notes and read out material printed on chalk board.
- Provide additional orientation to learning environment (e.g., laboratory, gym, computer center).
- Arrange for classmate or another student in the same faculty to provide tutoring.

TABLE 4

Assignment Accommodations

- Provide student with a detailed syllabus/course outline to give ample lead time to complete course assignments.
- Loan students material from private library for research.
- Allow students to complete alternative assignments (if necessary).
- Extend deadlines for completion of assignments.
- Endorse student use of a proofreader in correction of grammar/punctuation.
- Allow student to give oral tape-recorded presentation rather than written.
- Allow student to do an extra credit assignment (option not available to non-disabled students).
- Allow student to give a written presentation rather than an oral presentation.

TABLE 5

Examination Accommodations

- Allow extra time for completion of exam.
- Allow/arrange for exam to be taken in an alternative location.
- Allow/arrange for exam in alternative format (e.g., braille, large print, tape).
- Allow student to use calculator, spell checker, computer, etc.
- Allow student to dictate answers to proctor/amanuensis.
- Allow student to tape essay questions.
- Base grade on process (i.e., correct computation) as well as product (i.e., correct answer).
- Allow student to take an alternative form of exam (e.g., multiple choice rather than essay).
- Allow a proctor to rephrase exam (e.g., for clarity).
- Allow misspellings, incorrect punctuation, poor grammar without penalty.

3. Organize In-Service Training for Lecturers.

Some diaspora scholars and their colleagues may possess experience in providing disability-specific in-service training. Such training has the potential to increase the knowledge and raise awareness of participants. It should be stressed that the amount of contact and experience in instructing SWDs will vary among lecturers, administrators, and staff. The scholars should conduct these workshops periodically throughout the academic year, to sensitize their host communities to the needs of SWDs.

There are two approaches to this. First, disability-specific in-service training can be organized before the beginning of the semester. The topics could focus on the needs of a particular group, for example, students with specific learning disabilities, hearing impairments, or albinism. Second, general training can be offered periodically throughout the academic year to sensitize lecturers, administrators, staff, and the student body to the needs of SWDs. Ultimately, the aim is to modify the attitudes of the university community toward the various groups that have often been perceived as problematic on campus.

4. Establish a Disability Resource Center on Each Campus.

From my personal and professional observations, most tertiary institutions in Africa have failed to set up Disability Resource Centers (DRCs) that could provide the much-needed guidance to facilitate their institutions' curricula and inclusion of their SWDs. In the few universities that have set up their DRC, they seem to lack the capacity to accurately track the number of SWDs who apply, are admitted, are retained, and/or graduate. Thus, when SWDs are admitted, they frequently rely on students, friends, and/or family members to explore halls of residence, lecture rooms, libraries, technology, recreation, and worship centers. Furthermore, SWDs often experience delays in obtaining vital resources and services which can negatively impact their ability to pursue a program of higher education. Diaspora scholars and professionals can leverage their knowledge and experiences to assist their home countries' institutions to establish viable DRCs. This implies that the staff of these newly created DRCs must be trained and encouraged to respond positively to needs of SWDs and faculty with special needs.

5. Encourage Active Research into Disabilities and Inclusive Practices in Africa.

Diaspora scholars and researchers have critical roles to play in collaborating with colleagues in home institutions to determine empirically the educational, cultural, social, psychological, and emotional effects of disabilities on inclusive education and other practices on children, youth, and adults with and without disabilities, their teachers, parents, counsellors, healthcare providers and others. As previously stated, there are learners and workers with various types of disabilities. There are also students and workers in nomadic and other special programs, including those identified as gifted and talented. Diaspora scholars can explore international grants and collaborate with qualified home-based researchers to access funds for multi-year, quantitative and qualitative research projects, as approved by each university's institutional review board (IRB).

6. Establish a Permanent Funding Plan for Research and Service.

Scholars should encourage host institutions to set aside substantial competitive grants each year to conduct comprehensive, methodologically sound research on disability-related issues affecting the universities and the wider society. Such rigorous research efforts should: (a) examine the various disabilities and their etiologies, including standardising names in all African languages for describing each disability to facilitate communication among medical service providers, parents and teachers; (b) establish culturally sensitive, ecologically valid assessments and instructional strategies for all PWDs; and (c) ensure that lecturers, social workers, counsellors, psychologists, medical specialists, and parents form mutually beneficial partnerships that will contribute to the social, psychological, and educational growth of all learners.

7. Promote Universal Design Principles Campuswide.

According to Edwards et al. (2022), universal design (UD) implies planning to build learning, physical, and work environments so that they are usable by a wide range of people, irrespective of age, size, or disability status. Ronald Mace, the late renowned American architect, was the originator of UD. He led a team of architects, product designers, engineers, and environmental researchers to formulate a set of seven principles, the full incorporation of which would mean that everyone would be able to access both the built and social environments. The seven principles are:

- Principle 1: Equitable Use—The design is useful and marketable to people with diverse abilities.
- Principle 2: Flexibility in Use—the design accommodates a wide range of individual preferences and abilities.

- Principle 3: Simple and Intuitive Use—Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- Principle 4: Perceptible Information—The design communicates necessary information effectively to the user, regardless of ambient conditions or the individual's sensory capabilities.
- Principle 5: Tolerance for Error—The design minimizes hazards and the adverse consequences of accidental or unintended actions.
- Principle 6: Low Physical Effort—The design can be used efficiently and comfortably and with minimum fatigue.
- Principle 7: Size and Space for Approach and Use—Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility (Centre for Excellence in Universal Design, 2020).

From the preceding narrative, one can readily see the far-reaching potential of UD to enhance students' academics and socialization, as well as workers' job performance and satisfaction. As an illustration, in undertaking my teaching and research tasks as a professor who is blind, I utilize the Blackboard learning management system retrofitted with speech access software to create and deliver online courses. In this context, I find that a website that is constructed with headings, well-organized content, and keyboard navigation is beneficial as a user of a screen reader and has potential advantages for those with learning disabilities. Furthermore, everyone else using the website will find it easier to follow because it is more visually appealing. Therefore, creating accessible electronic content, learning environments, and physical spaces entail additional thought and planning at the initial stages. Policymakers in institutions of higher learning in Africa must realize that it is much easier, however, to plan for accessibility at the outset than to attempt to retrofit an inaccessible course or program to make it accessible.

8. Inaugurate a Ten-Year Technology Plan of Action for SWDs in Africa.

Given the pivotal role that technology plays in higher education, and the current unsatisfactory state of specialized technology service for SWDs in all higher institutions, it is recommended that the Carnegie African Diaspora Fellowship Program (CADFP) initiate and fund a ten-year technology plan for SWDs. The proposed new initiative would capitalize on the foundation's strategic position to engage experts anywhere with pertinent techno-pedagogy. These experts would be charged with the responsibility to foster opportunities for SWDs to acquire hands-on training in the utilization of specialized miscellaneous devices and software programs

that would create a level playing field for them. Ultimately, this unique model of training would substantially increase the quality of learning and employability of SWDs.

In high-income countries, it is well-known that specialized technologies are easily accessible and widespread because of effective legislation and advocacy as well as philanthropic initiatives. The information and knowledge derived from the application of technologies in these countries clearly attest to the fact that there cannot be a single technological solution that will suit the myriad needs of SWDs. These are crucially important facts that policy managers in Africa must understand as they plan and set up technology programs for SWDs. The recent sudden outbreak of COVID-19 has taught us important lessons of our general state of unpreparedness for appropriate specialized hardware devices, software programs, and disability-friendly platforms for online course delivery models that accommodate the learning needs of SWDs. COVID-19 has exposed the deficiencies in the curricula of higher education, and in teacher preparation and continuing professional development activities. Therefore, it is no longer acceptable to use cost as a pretext to deny SWDs in Africa access to modern technology and training. Additionally, it is stressed that for optimizing the benefits of specialized technology service, lecturers and support staff involved must acquire the requisite knowledge and skills to remain relevant in the overall scheme of things.

Concluding Remarks

Education is a sine qua non to human survival because it serves as a conduit through which the knowledge, learning and skills of a society is passed from generation to generation, and SWDs should be encouraged to participate in postsecondary education experiences. In this context, existing institutions like the Association of African Universities, the African Union Agenda 2063, the Continental Education Strategy for Africa 16-25, the Science, Technology, and Innovation Strategy for Africa 2024, and the Global 2030 Sustainable Development Goals Agenda must all refocus their mission and vision to effectively respond to the general needs of our hitherto marginalized SWDs.

The desire for inclusive tertiary education is growing on the continent. The expectation for better futures increases and inspires the need for greater knowledge and understanding about best practices in providing inclusive primary, secondary, and tertiary education, even for students with intellectual and developmental challenges, as is currently being implemented in high-income countries. Tertiary education in Africa has the potential to enable SWDs to fulfill personal goals; to allow for effective competition in the workforce; and to contribute to independence, financial security, and political engagement. Thus, it is desirable that the continent's education authorities and their international partners gear their policies toward enabling SWDs to realize their dreams and aspire through the development of relevant curricula and quality tertiary education.

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Policy Implications for Higher Education
in Africa: Models for Engaging the
Academic Diaspora

Lessons from Alternative Models of Engaging the Africa's Academic Diaspora

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EXECUTIVE SUMMARY

Higher education services in Africa have been outpaced by the enormous demand of Africa's growing population. Higher education institutions are facing challenges such as acute shortages of faculty mentors and a lack of resources for conducting quality research training and outreach. This paper addresses three of the five themes of the Carnegie African Diaspora Fellowship Program (CADFP) 2021 conference, including: (1) building and enhancing research, teaching, and/or service capacity of host universities; (2) implementing mutually beneficial collaborations; and (3) mentorship of the next generation of faculty, researchers, and scientists. The collaborative engagement models shared include a consortium of six higher education institutions in the United States and Canada collaborating with six higher education institutions in East Africa to build human and institutional capacity in managing transboundary diseases; a dual Master of Science degree and joint study-abroad program between US and African universities; and joint conferences and workshops between the US, Canada, and Africa with integrated collaborative research, teaching, and outreach and mentorship for students and junior faculty, as well as professional development for female faculty. Furthermore, the authors share information on the following four of the five objectives of the 2021 CADFP alumni convening: (1) practices, learnings, challenges, and opportunities related to engagement with higher education institutions on the African continent; (2) collaborative projects completed that expanded academic communities across Africa; (3) ongoing and past projects the diaspora has engaged in resource mobilization for African higher education; and (4) new knowledge generated about diaspora linkages and how it was disseminated through various publications (peer-reviewed papers in a special-issue journal, *Pan African Medical Journal*), scientific conferences, workshops, policy reports, and community-engaged service-learning projects. The paper concludes by highlighting lessons learned, best practices in implementing mutually beneficial collaborations, challenges experienced in engagement with higher education institutions in Africa, and policy implications for Africa's higher education systems.

Background

In Africa, the capacity of governments and private institutions to provide the necessary framework to ensure an appropriate balance between the provision of private and public goods and services, such as education, has been outpaced by the enormous demand of the country's growing population. Higher education institutions are among the most stable and sustainable institutions on the continent, with an enormous untapped skilled human resource and infrastructure that can help address Africa's developmental challenges. Higher education institutions

are endowed with enormous high-value human capital, infrastructure, and partnerships, which when harnessed in an organized manner can accelerate the continent's growth in ways that propel Africa's steady growth and global engagement. Yet challenges exist such as an acute shortage of faculty mentors and a lack of resources for conducting quality research training and outreach at higher education institutions. Engaging the African diaspora through programs such as the CADFP, led by Carnegie Corporation of New York, can play a significant role in addressing some of these challenges.

Practices, learnings, challenges, and opportunities related to engagement with higher education institutions on the African continent

Case studies of engagement with higher education institutions in Africa

"Capacity Building in Integrated Management of Transboundary Animal Diseases and Zoonoses (CIMTRADZ)"

Partnership in higher education is now widely accepted globally. Various higher education institutions, mainly from developed countries, partner with institutions from low developing countries with the aim of preparing students to gain competencies in global and intercultural experiences and development (Olson & Kroeger, 2001; Graham et al., 2013). This trend is driven by global interconnectedness, including the ever-increasing population growth, climate change, diminishing natural resources, economic fluctuations, and more recently the scourge of emerging and reemerging infectious diseases that have no respect for geographical borders (Olson & Kroeger, 2001). Global and intercultural competencies have been broadly defined to include knowledge about several dimensions of global and international cultures; appreciation of cultural, racial, and ethnic diversity; understanding the complexities of issues in global context; and comfort in working with people from other cultures (Olson & Kroeger, 2001). To achieve these global, international, and intercultural competencies, partnerships in higher education institutions have used different approaches, including sharing and the adoption of curricular programs; providing opportunities for staff and student exchange programs; undertaking joint activities in terms of training, research, and outreach; and joint academic programs (Olson & Kroeger, 2001). With this realization, the United States Agency for International Development (USAID) awarded 11 partnership grants to universities in Africa and the United States to address national and regional priorities in sub-Saharan Africa (Ekiri, Khaita, & Kabasa, 2013a). One of the 11 grants was *"Capacity Building in Integrated Management of Transboundary Animal Diseases and Zoonoses (CIMTRADZ)"* (2011–2015) in eastern and central Africa (Khaita, Kabasa, et al., 2017). The goal of CIMTRADZ was to offer human and institutional capacity development in higher education institutions in Africa with an emphasis on animal production and health and food security. CIMTRADZ was led by Makerere University in Africa and North Dakota State University and Mississippi State University in the US. Participating institutions in Africa included the University of Nairobi, Kenya; Sokoine University of Agriculture, Tanzania;

the National University of Rwanda, Rwanda; Mekelle University, Ethiopia; and IGAD Sheikh Technical Veterinary School, Somalia. The five North American universities included Michigan State University, Mississippi State University, Washington State University, Columbus State University, and the University of Saskatchewan. A detailed description of the CIMTRADZ project, including the genesis, management structure, accomplishments, lessons learned, and challenges, was published in a special issue of the *Pan African Medical Journal* (Khaita, Kabasa, et al., 2017).

"RUMPELHA: Regional University-Mediated Partnerships for Enhancing Livelihoods and Health in Africa"

Regional University-Mediated Partnerships for Enhancing Livelihood and Health in Africa (RUMPELHA) is a university-led inclusive continental alliance for transformation and building capacity in higher education systems in Africa while respecting cultural, ethnic, and gender diversity (Kabasa et al., 2017). An outcome of CIMTRADZ, RUMPELHA's goals align with the African Union's higher education Agenda 2063: to harmonize curricula in higher education in Africa to allow quality assurance, mobility of faculty, joint and collaborative research, and training against locally, regionally, and internationally agreed benchmarks of excellence (African Higher Education Summit, 2015). RUMPELHA is a promising university partnership in Africa that was endorsed by the African Union–InterAfrican Bureau for Animal Resources on July 18, 2014.

Conventional African higher education systems failed to transform the common person, youth, community, business, or industry on the continent as a whole, and the growing population of unemployed youth is a serious security risk; yet the youth dividend if harnessed well can leapfrog Africa's development (Kabasa et al., 2017). Therefore, there is need for a presiding regional body to coordinate member state higher education efforts, including those of research institutions and higher education institutions, in support of the continental agenda. Currently, institutions are largely conducting efforts at a regional level singularly or informally. A framework for nurturing future African leaders and African citizens is critical. Moreover, no one is clearly articulating the goals and vision of the African Union to African youths in a coordinated manner. RUMPELHA provides the framework that will support the African Union's Higher Education Agenda 2063 and the United Nations 2030 Agenda for Sustainable Development.

Mentoring graduate students and junior faculty at Makerere University, Uganda, and Sokoine University of Agriculture, Tanzania

The Carnegie African Diaspora Fellows (Margaret L. Khaita, John B. Kaneene, and Florence Wakoko-Studstill) mentored

graduate students and junior faculty at Makerere University, Uganda (2014 and 2017), and at Sokoine University of Agriculture, Tanzania (2017). The Fellows strengthened the curriculum for the Master of Science degree in International Infectious Disease Management (MS-IDM) (Ekiri, Khaita, & Kabasa, 2013). Additionally, they participated in setting up a Center for Biosecurity and Global health (CEBIGHA) at Makerere University. Furthermore, the Fellows refined the MS-IDM degree and developed specializations/tracks in the program. They also strengthened the social science aspects of the curriculum, particularly women and gender studies at the Centre for Gender Studies at Sokoine University of Agriculture. Building on the work conducted by the Fellows at Makerere University, under CIMTRADZ, the Fellows scaled up that effort at Makerere University and Sokoine University of Agriculture through graduate student training and mentoring in research methods, leadership, and One Health competencies. Fellows Khaita and Wakoko-Studstill taught quantitative and qualitative research methods, respectively, to 15 graduate students enrolled in the MS-IDM program at Makerere University and research methods to 23 graduate students in the College of Social Sciences and Humanities at Sokoine University of Agriculture. Khaita also team-taught epidemiology at Makerere University with another CADFP Fellow, Dr. Patrick Pithua. Students were also trained in Model African Union (MAU), a culturally sensitive novel pedagogy for simulating leadership and One Health competencies in African contexts. Fellows mentored researchers at Makerere University and Sokoine University of Agriculture in grant writing and collaborative research. A short course on grant proposal writing was offered to about 50 scientists at Sokoine University of Agriculture (graduate students and academic staff), and the students submitted five small grants (\$20,000 each) to the U.S. Department of State, Dar es Salaam, Tanzania.

The Fellows also participated in collaborative research projects. Both Fellows participated in joint research and grant writing with Makerere University, Sokoine University of Agriculture, and Higher Education Resource Services—East Africa (HERS-EA). At Sokoine University of Agriculture, the Fellows collaborated with researchers at the Centre for Gender Studies and submitted two small grants (\$20,000 each) to the U.S. Department of State, Dar es Salaam, on July 31, 2017. Also, Sokoine University of Agriculture and the Fellows submitted a proposal to the USDA Foreign Agricultural Service (FAS) (\$40,000) in June 2017 that was funded. The project trained women smallholder farmers in Tanzania in poultry production. The Fellows successfully organized the HERS-EA ACADEMY for women in higher education institutions in East Africa (July 2–8, 2017). A total of 70 women from HERS-EA (Burundi, Kenya, South Sudan, Tanzania, and Uganda) attended. The ACADEMY was completed in collaboration with HERS-EA, a nongovernmental organization (NGO) that provides leadership and management development training

for women. The Fellows Khaita and Wakoko-Studstill, both alumnae of HERS Denver, were instrumental in starting HERS-EA in August 2014, with partial support from CADFP. The fellowship enabled the Fellows to participate in the ACADEMY as resource persons and to facilitate signing of a memorandum of understanding between Sokoine University of Agriculture and HERS-EA for Sokoine University of Agriculture to host a HERS-EA office in Tanzania.

Diaspora engagement in One Health

The Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (WOAH, formerly the Office International des Epizooties—OIE), and the World Health Organization (WHO) have developed One Health core competencies that have been recommended as skills and knowledge that all One Health professionals should possess (OIE, 2012). The tripartite organizations have recently been joined by The United Nations Environment Program (UNEP). These four intergovernmental organizations (IGOs) or quadripartite currently lead global efforts in One Health, advised by the newly formed One Health High Level Expert Panel (OHHLEP) (WHO, 2021).

One Health technical skills incorporate the fundamental values of veterinary, human, and environmental health, whereas One Health soft skills include management, communication, values and ethics, leadership, teamwork and collaboration, research, systems thinking, policy and advocacy, and cultural competency. The American Veterinary Medical Association (AMVA) Council on Education (COE) has recommended that graduating veterinarians possess these competencies to ensure quality veterinary services nationwide (AVMA, 2008). The African diaspora coauthors of this paper—collaboratively with colleagues in host institutions in Africa and other institutions outside of Africa—have played a key role in implementing One Health competencies in African academic institutions, particularly in eastern and central Africa.

The One Health approach was implemented through several projects, such as the USAID-supported CIMTRADZ project (Ekiri et al, 2013a, Khaita, Kabasa, et al., 2017); the USDA-funded joint/dual MS-IDM (Ekiri et al, 2013b, Majalija et al., 2017); and the joint study-abroad course, Tropical Veterinary Medicine and One Health (Ekiri, Aceng, Khaita, et al 2013; Khaita, Ejobi, et al., 2017). Also, Khaita serves on the OHHLEP (WHO, 2021).

One of the most recent strategies for conducting biomedical research efficiently and cost effectively is the application of a One Health approach. Kaneene at Michigan State University and co-collaborators in Tanzania (Sokoine University of Agriculture and Muhimbili University of Health and Allied Sciences) are conducting research and training of

graduate students in One Health. The research and training, funded by the Kolschowsky Foundation, focuses on a comparative study of brucellosis in farmers and their livestock in Monduli District in northern Tanzania.

Select examples of diaspora engagement in Ghana, Malawi, Ethiopia, Rwanda, South Africa, and Uganda

Over the past 15 years, we have engaged in research, graduate training, and capacity building programs in all regions of sub-Saharan, eastern, central, southern, and western Africa. Examples of such programs warrant mentioning here. Using grants from the USDA-FAS, the Bill & Melinda Gates Foundation, and the International Fund for Agricultural Development, Kaneene and co-collaborators conducted research and training of graduate students and junior faculty members in Malawi (Kaneene, Thiagarajan, et al., 2016), Uganda (Kaneene, Ssajjakambwe, et al., 2016; Kaneene, Majalija, et al., 2017), South Africa (Kaneene et al., 2015), and Ghana (Johnson et al., 2019). At Makerere University in Uganda and at Mississippi State University, the CADFP Fellow Wakoko-Studstill introduced a simulation model (MAU) in One Health curriculum (Wakoko-Studstill, Khaita, et al., 2017); conducted research with students and junior faculty to promote gender mainstreaming in veterinary education (Wakoko-Studstill, Kiguli, et al., 2017); developed a curriculum that integrated socioeconomic pedagogies in the Master of Science degree program, trained students and junior faculty in service-learning pedagogy, and engaged them through rabies vaccinations (Isiko, Okech, Nakanwagi, et al., 2017); and served on the FAO/OIE/WHO expert team to develop a guide for countries on taking a One Health approach to addressing Zoonotic diseases (WHO, 2019).

Collaborative projects completed that expanded academic communities across Africa

Collaborative research projects that have built capacity of host universities

In the past few decades, African universities have been under intense pressure to increase their research productivity. To do so, these institutions will need to secure extramural grants, hire faculty with training and research skills, or train current faculty in skills in grant writing, conducting research, and publishing their work in refereed journals. The authors therefore conducted research and training activities between East African and North American universities under the CIMTRADZ project to develop mutually beneficial and sustainable research and training collaborations (Kaneene, Khaita, et al., 2017). Research covered major zoonotic and

transboundary animal diseases in East Africa, improving laboratory capabilities for development of molecular diagnostic tests and establishment of standard operating procedures for the laboratories (Mukiibi, et al, 2017; Muzoora, et al, 2017). Training programs for faculty and graduate students included ethical conduct of research, grant writing, presentation of research findings at scientific conferences, strategies in publishing papers in peer-reviewed journals, and financial management of research grants. Major accomplishments of the research and training activities included increased awareness and adherence to ethical conduct of research and the use of standard operating procedures, increased rate of participation in joint grants applications, joint publications, understanding of grant budget management, creation of joint master's degrees, and development of short courses. A model for implementing a multifaceted research and training program involving universities from high- and low-income countries was developed. Using major funding from USAID, we conducted collaborative research and training programs involving five African universities (Makerere University, the University of Nairobi, Sokoine University of Agriculture, the National University of Rwanda, and Mekelle University) and five North American universities (Michigan State University, Mississippi State University, Washington State University, Columbus State University, and the University of Saskatchewan). The research and training focused on CIMTRADZ. The program was such a success that a special issue of the *Pan African Medical Journal* was published dedicated to that volume of work (Khaita, Kaneene, & Kabasa, 2017).

Collaborative training projects that have built capacity of host universities

Joint/dual degrees (e.g., MS in International Infectious Disease Management and Biosecurity) between Makerere University and North Dakota State University

Globally, it is estimated that, one billion cases of illness and millions of deaths occur every year from zoonoses (WHO, 2021). As the world is inter-connected, emerging zoonoses in one country are potentially a threat to global health security. As institutions of higher learning train the next generation workforce, they need to be equipped with skills needed to address complex problems of the future including emerging and re-emerging infectious diseases. As a way of providing such skills to students, Makerere University and North Dakota State University partnered (with support from USDA Higher Education Challenge grant) in developing the first United States-Africa trans-Atlantic dual degree using an integrated disease management approach that addresses emerging and re-emerging infectious diseases. The MS degree in

International Infectious Disease Management and Biosecurity developed was approved in 2011 (Ekiri et al 2013b; Majalija, Owiny Okello, Khaita, Freeman, et al, 2017). Many graduates of this program have participated in managing global health challenges, such as the Ebola and COVID-19 pandemics. The detailed curriculum of this program, challenges experienced, and lessons learned to inform future similar endeavors in internationalizing curricula in higher education were published elsewhere (Ekiri et al 2013b; Majalija, Owiny Okello, Khaita, Freeman, et al., 2017).

With support from USAID, Makerere University and North Dakota State University led a consortium of at least 10 other institutions of higher learning from the US and East Africa under CIMTRADZ project. Several activities were conducted under CIMTRADZ including faculty exchange and joint short-term training to students, such as workshops, fellowships for graduate students' stipends and research, and joint mentorship of students by faculty at both institutions. Annual workshops (termed Cultural Bomas) and scientific conferences were initiated at Makerere University, Uganda with support of the USAID grant and continued beyond the life of the grant. The Cultural Boma was the name coined to depict the inter-generational knowledge exchange platform that happens in the African context (Okech, Majalija, Okello Owiny, et al., 2017). Details of how CIMTRADZ project supported institutional and human capacity development efforts were described in detail in a special issue Pan African Medical journal (Khaita Kabasa, Kaneene, et al, 2017).

Joint summer study-abroad course (Tropical Veterinary Medicine and One Health)

A "Tropical Veterinary Medicine and One Health" course was developed jointly by Mississippi State University, College of Veterinary Medicine and the Makerere University, College of Veterinary Medicine, Animal Resources and Biosecurity in 2014. The course involves international travel by Mississippi State University students to Uganda and is delivered in a format involving lectures from international experts and experiential field trips. Students from both institutions normally join the course (Khaita, Ejobi, et al, 2017). With support from USAID funded CIMTRADZ project, students from participating institutions in East Africa were able to participate in this course. Students successfully completing this course are able to contribute to a globally engaged science workforce. The course provides a foundation for tomorrow's global citizens, global career development opportunities, and ability to work and understand diverse animal production, food safety and public health systems. Students engage in service-learning activities in various communities in Uganda using a One health approach (Okech, Tumwine, Majalija, et al., 2017). Additionally, the course provides an opportunity for cultural immersion & exchange (Khaita, Ejobi, et al, 2017).

A paper published in the *Pan African Medical Journal* summarizes experiential learning opportunities offered in tropical veterinary medicine and One Health, including sample itineraries and One Health service-learning activities completed by students from higher education institutions in the US and East Africa and central Africa (Khaita, Ejobi, et al., 2017).

Collaborative outreach and service-learning projects that have built capacity of host universities

With support from the USAID, Fellows implemented several community-service projects as part of a multidisciplinary One Health student training approach. Select projects included community education on control of Newcastle disease in poultry, rabies in dogs, brucellosis in cattle (in Uganda) using vaccinations and a local radio talk show on control of brucellosis (Okech, Tumwine, et al., 2017; Isiko, Okech, et al., 2017), and control of Rocky Mountain spotted fever (in the US). Participants comprised junior faculty, graduate students, and professional students in the following disciplines: veterinary medicine, public health, biomedical laboratory technology, and microbiology. In Uganda, the students were joined by the local area District Medical Officer and District Veterinary Officer.

Four exchange graduate students from Uganda participated in the Rocky Mountain spotted fever intervention in Arizona in collaboration with the U.S. Centers for Disease Control and Prevention (CDC). As a result of networking at the CDC Veterinary Day, the CDC and students from Virginia Tech, North Dakota State University, and Makerere University participated in Rocky Mountain spotted fever intervention in Arizona. This outreach activity was led by the CDC's Rickettsial Zoonoses Branch in the Division of Vector-Borne Diseases, as part of the National Center for Emerging and Zoonotic Infectious Diseases.

Ongoing and past projects the diaspora has engaged in resource mobilization for African higher education

Sample past projects

Promoting global expertise in emerging infectious diseases of animals, funded by USDA, HEC Grants Program

Makerere University and North Dakota State University developed the first United States–Africa transatlantic joint degree addressing integrated disease management and

international biosecurity. The two institutions received a collaborative grant from the USDA HEC Grants Program to develop a joint MS-IDM degree. This grant helped develop the joint MS-IDM program and graduate certificate, as well as support four graduate students' stipends and research (Majali et al., 2017).

CIMTRADZ in central and eastern Africa, funded by USAID (2010–2015)

The CIMTRADZ collaborative project involved a consortium of higher education institutions from Africa and North America that was focused on sustainable human and institutional capacity development in management of transboundary diseases and zoonoses in East Africa and central Africa (Khaita, Kaneene, & Kabasa, 2017). A paper published in the Pan African Medical Journal (Khaita, Kabasa, Kaneene, Ekiri, et al., 2017) provides an overview of CIMTRADZ by describing the genesis, rationale and organization, management structure, accomplishments, lessons learned, and challenges.

Sample ongoing projects

Training smallholder poultry farmers in East Africa using poultry (Uganda and Tanzania)

CADFP Fellows Khaita, from Mississippi State University; Odoi, from the University of Tennessee; and Wakoko-Studstill, from Columbus State University, in collaboration with Jeckoniah from Sokoine University of Agriculture and Lumutenga from HERS-EA and supported by the USDA-FAS, have: (1) developed a curriculum for and trained women smallholder farmers in Tanzania and Uganda in best practices in poultry production; (2) secured extension pamphlets on best practices on poultry production; and (3) identified challenges and prospects facing these women. The team has translated extension publications into local languages (Swahili) and established cooperatives or Savings and Credit Cooperative Organizations for better access to information on poultry production. HERS-EA, with researchers at higher education institutions in East Africa, as well as Michigan State University and the University of Tennessee, has conducted action research on constraints to poultry production that women smallholder farmers in East Africa face (Khaita, et al., 2021).

Harmonizing sanitary and phytosanitary regulatory regimes across the eight regional economic communities of the African Union, sponsored by the USDA-FAS

This project is premised on the knowledge that a key barrier to the adoption of the African Union Sanitary and

Phytosanitary Policy Framework is a lack of human capital with knowledge, support, and leadership to implement policy instruments at national, regional, and continental levels. Challenges also exist with oversight, understanding and expressing value, streamlining across regional economic communities and within member states, and developing a coalition of support from key stakeholders for adoption and implementation. The project seeks to develop such leaders through training and support to augment knowledge and skills with the connections necessary to be change agents at the regional economic community and national level. The project aims to recruit 24 Fellows from the continent of Africa to work with USDA-FAS and Michigan State University faculty to build and streamline efforts within the regional economic communities toward adoption of a unified sanitary and phytosanitary framework. Eight Fellows (one from each of the eight African Union regional economic communities) will conduct collaborative research with faculty at Michigan State University.

New knowledge generated about diaspora linkages and how it was disseminated through various publications

Pan African Medical Journal special issue

Today's world has increasingly interconnected economic, political, cultural, and scientific systems, resulting in rapid movement of goods, people, and ideas, and offering unprecedented opportunities for many countries especially those in sub-Saharan Africa. However, there are considerable challenges, including global pandemics, such as COVID-19. At least 70% of the known human and animal pathogens affecting production, public health, global trade, and security are resident in sub-Saharan Africa, and in particular eastern and central Africa. This region has therefore become a risk incubator for Africa and the world. The *Pan African Medical Journal* special issue summarized accomplishments of the project "Capacity Building in Integrated Management of Transboundary Animal Diseases and Zoonoses (CIMTRADZ)," implemented by three CADFP Fellows (Kaneene, Khaita, and Wakoko-Studstill). The 24 peer-reviewed papers published in this special-issue journal were assembled in five major themes related to the various approaches and major accomplishments of the USAID-supported CIMTRADZ project. The five themes were: (1) Partnership Models of CIMTRADZ; (2) The CIMTRADZ Approach to Teaching, Curriculum Development, and the Cultural Boma; (3) Original Scientific Research Conducted under CIMTRADZ; (4) Surveillance and Outbreak Investigations in CIMTRADZ; and (5) CIMTRADZ Approach to Outreach and Service Learning.

Diaspora CADFP Fellows Kaneene and Khaita served as editors for this special-issue journal.

Scientific workshops (Boma) at Makerere University

With support from the USAID funded CIMTRADZ project, annual workshops (termed Cultural Bomas) were initiated at Makerere University, Uganda and continued beyond the life of the grant. During these workshops collaborating faculty from CIMTRADZ participating institutions offered workshops in their areas of expertise to students who attended the workshops. Topics covered included Disease outbreak investigation, Research methods, Data analysis, diagnostic techniques for diseases such as rabies. The African context of the term "Boma" is explained in detail in another paper by Okech, Majalija, et al (2017). Apart from offering workshops, the boma provided opportunity for faculty from multiple institutions to network, share research, mentor students, and develop further research collaborations. Additionally, students from multiple institutions and disciplines, including, veterinary medicine, public health, wildlife, medical laboratory technology, microbiology, animal production and food safety worked collaboratively using the one health approach. This intergenerational engagement of faculty and students resulted into faculty and student exchange, student mentorship, joint research, publications, and grants. The Boma successfully contributed to development of the Global One Health Workforce and The Global Health Security agenda goals.

Scientific conferences

CADFP Fellows from Uganda (Kaneene, Khaita, and Wakoko-Studstill) and others (Pithua and Odoi) have participated and presented papers at the annual scientific conferences led by Makerere University and organized under RUMPELHA. These conferences were initiated and supported under the CIMTRADZ project (2010–2015); however, the conferences have been one of the successful project outcomes that have been ongoing sustainably thereafter.

Furthermore, the CADFP Fellows and hosts have presented collaborative projects at scientific conferences with the support of CADFP alumni grants. For instance, in 2021 Khaita and Majalija presented a collaborative research paper at the 2021 Engagement Scholarship Consortium (ESC) Conference (September 13–15, 2021) (Majalija, Tumwine & Khaita, 2021). The ESC is a 501(c)(3) nonprofit educational organization composed of higher education member institutions, a mix of state-public and private institutions. ESC's goal is to work collaboratively to build strong university-community partnerships anchored in the rigor of scholarship and designed to help build community capacity (ESC, 2021). Several Fellows and student mentors have also presented at scientific conferences in Africa and abroad.

Mentorship of the next generation of faculty, researchers, and scientists

Mentorship for undergraduate and graduate students and junior faculty at Makerere University (Uganda) and Sokoine University of Agriculture (Tanzania)

With support from CADFP, the Fellows Kaneene, Khaita, and Wakoko-Studstill conducted mentorship for undergraduate and graduate students and junior faculty at Makerere University, Uganda (2014 and 2017), and at Sokoine University of Agriculture, Tanzania (2017). The Fellows strengthened the curriculum for the MS-IDM degree at Makerere University. They refined the degree and developed specializations/tracks in the program. Additionally, they participated in setting up a Center for Biosecurity and Global health (CEBIGHA) at the College of Veterinary Medicine Animal Resources and Biosecurity at Makerere University. They also strengthened the social science aspects of the curriculum, particularly women and gender studies at the Centre for Gender Studies at Sokoine University of Agriculture. Dr. Khaita and Dr. Wakoko-Studstill facilitated a one-week HERS-EA Leadership ACADEMY—a workshop for women in higher education institutions at Makerere University.

Mentorship for graduate students and junior faculty from Makerere University (Uganda) at Mississippi State University and Michigan State University

In 2014, eight junior faculty from Makerere University attended four months of training at Mississippi State University and Michigan State University. The training was varied and extensive and included laboratory capacity development, food safety, grant writing, and policy development. Two of the eight junior faculty submitted collaborative grants with faculty in the U.S. higher education institutions that were funded during this time (Muzoora et al., 2017). On return to Makerere University, the junior faculty have continued engaging in collaborative research, teaching, and outreach with U.S. counterparts, as well as developing teaching labs and improving pedagogy in their courses.

Mentorship for junior faculty from English-speaking African universities at Michigan State University: Faculty Exchange Program in African Veterinary Science, funded by USDA-FAS (2016–2019)

From 2016 to 2019, six to eight junior faculty members from different African universities spent one semester each year at Michigan State University to learn new research strategies, detailed course instruction, grant writing, and laboratory skills, as well as gain professional relationships with Michigan State University faculty for future collaborations. Michigan State University hosted junior faculty from 10 English-speaking

African veterinary institutions through the USDA Faculty Exchange Program, including Makerere University, Uganda; Sokoine University of Agriculture, Tanzania; Haramaya University, the University of Gondar, Jimma University, Mekelle University, and Addis Ababa University, Ethiopia; the University of Nairobi, Kenya; the University of Ghana and Kwame Nkrumah University of Science and Technology, Ghana; and the Federal University of Agriculture, Abeokuta, and the University of Ibadan, Nigeria.

Mentorship for graduate students and junior faculty in conducting research, practicing diplomacy, following formal rules of parliamentary procedure, drafting resolutions, and formulating debate agendas and policy mandates using MAU simulation

The MAU simulation is a pedagogy that integrates social sciences in veterinary medical training through active and problem-based learning. The MAU addresses global trends using contemporary African issues related to One Health, trade and economic growth, gender empowerment, human development, peace and security, democracy, institution building, and human rights issues (Wakoko-Studstill, Khaita, Okech, et al., 2017; SEMAU, 2013). The MAU simulation engages students in conducting research, practicing diplomacy, following formal rules of parliamentary procedure, drafting resolutions, and formulating debate agendas and policy mandates along the lines of the African Union (SEMAU, 2013; African Union, 2014). CADFP Fellows Wakoko-Studstill and Khaita collaboratively with CIMTRADZ partners conducted MAU simulation at Makerere University in Uganda (with participation of students from five CIMTRADZ African higher education institutions and Mississippi State University) and with about 100 Doctor of Veterinary Medicine (DVM) students at Mississippi State University's College of Veterinary Medicine.

Mentorship and professional development for women faculty through HERS-EA, a professional development model for women

A report of the Association of Commonwealth Universities (ACU) indicated that women were underrepresented at senior levels of the academic and administrative hierarchies of Commonwealth universities; men outnumbered women by 4:1 at middle management levels and 10:1 at senior levels (Lund, 1998). In 1998, the ACU, through its Commonwealth Higher Education Management Service, published a report entitled "A single sex profession? Female staff numbers in Commonwealth universities" that highlighted the underrepresentation of women in the academic and administrative structures of Commonwealth universities (Lund, 1998).

Despite the exponential growth of higher education institutions in East Africa, women are persistently underrepresented in leadership and managerial positions

in East African universities (Carnegie Corporation of New York, 2019). Although some institutions, such as Makerere University, have implemented affirmative action measures to increase enrollment of girls in universities, there is a disproportionately low number of female role models on the faculty and staff (Wanyenze, 2019). Women who occupy administrative positions often face the challenge of a glass ceiling, which keeps them from rising to higher positions irrespective of their qualifications or achievements (Longman & Madsen, 2014). Moreover, in most African higher education institutions, sexual harassment and gender-based violence occurs, increasing the vulnerability of newly enrolled female students and of women in general (Dranzoa, 2018).

HERS-EA is an educational nonprofit organization advancing women leadership and management in East Africa (Burundi, Ethiopia, Kenya, Rwanda, South Sudan, Tanzania, and Uganda). Established in 2014 as an outcome of the CIMTRADZ project, HERS-EA is an affiliate of HERS based in Denver, Colorado, and established in 1972 (Khaita, Lumutenga, et al., 2017). The goal of HERS-EA is to raise the proportion of women in leadership and management positions in higher education institutions in East Africa to at least 50% (Khaita, Lumutenga, Muwazi, et al., 2017). The specific objectives of HERS-EA are: (1) to develop women leaders in higher education institutions in eastern Africa and (2) to empower women at multiple tiers of leadership and integrate the results to change systems (Khaita, Lumutenga, et al., 2017). HERS-EA's broad goals are to empower more women to finish primary and secondary schooling (through traditional and alternative routes)—both as a pathway to higher education and as a more immediate route to self-sufficiency, better health, and community development for a majority of women in the region. The core of the HERS-EA leadership model is for empowering (rather than just "helping") women across different tiers and connecting women researchers in higher education institutions to address unique research issues pertaining to women at all tiers (Khaita, Lumutenga, Muwazi, et al., 2017). A book on HERS-EA from Peter Lang Publishers is in progress, scheduled to be published by end of 2023.

Mentorship of graduate students in policy brief development and communication

Collaboration between higher education institutions and IGOs such as United Nations agencies (e.g., FAO, WHO, UNEP) is desirable to produce professionals with global competences in animal health, public health, and food security. The missions of these IGOs and their strategic plans normally align well with those of higher education institutions, making the two factors natural partners. These IGOs can participate in training students on global animal public health and food security. These collaborations benefit both the academic institutions and IGOs. Academic institutions could collaborate with IGOs in various ways, including utilization of IGOs'

information materials, relationship and awareness courses, distance learning courses, experiential learning courses, collaborating centers, and academic programs. Several graduate students from Makerere University participated in policy courses conducted by collaborative partners such as North Dakota State University, Washington State University, and the University of Minnesota, in collaboration with IGOs such as FAO, OIE, and the World Bank Group through a national and global policy course offered in Washington, D.C. (Isiko, Khaita, et al., 2017; Tendo et al., 2014).

Challenges, lessons learned, and policy implications for Africa's higher education

Implementation of the CIMTRADZ project presented some challenges, which included insufficient infrastructure or resources at partner institutions (both US and African); inadequate institutional support (higher administration, trained personnel in international partnerships); a lack of support for project personnel (resources, cost share, release time); frequent turnover of administrative leadership; delay in institutional review approvals from legal and regulatory structures governing research in different institutions (the Institutional Review Board and the Institutional Animal Care and Use Committee); and inefficient communication between all parties involved in the project (Higher Education for Development, African and North American partners). Factors that contributed to success of the project included the ability to work with interdisciplinary teams using a One Health approach across several institutions; the consortium model, which helped the partnership succeed as each institution contributed different strengths to the project; long-term relationships and networks in East Africa and central Africa; professional development, including leadership training and cultural sensitivity; institutional support (such as hiring additional personnel); and patience and maintaining a positive attitude.

Key lessons learned and advice for future implementers

The following factors are key to the success of such partnerships: (1) long-term relationships to ensure commitment and mutual respect of partners; (2) training at the beginning of the project to ensure a clear understanding of expectations from all parties involved; (3) host country ownership, leadership, and overall institutional support for collaborations to assess development challenges at the higher education and national levels; (4) commitment of staff and faculty members on both sides to accomplish results; (5) focus on a well-defined and mutually agreed upon problem solving plan to advance institutional capacity and address national development challenges, including aligning with national strategic priorities; (6) open and effective communication (including face-to-face meetings) and practice to share common goals and understandings and to deliver

desired results, including working with interdisciplinary teams (One Health); and (7) a well-defined results framework and monitoring and evaluation plan to track progress toward targets, make necessary adjustments, mobilize resources (including staff), and communicate with stakeholders (including funders).

Policy implications for Africa's higher education and sustainability plans

Future capacity development efforts in higher education in Africa could build upon current accomplishments and ensure sustainability of such efforts in Africa through: (1) strengthening and expanding access of higher education institutions to academic and training programs that have already been developed by previous projects and proven to be successful, such as the MS-IDM degree, the international summer course, and the international conference offered at Makerere University; (2) strengthening research capacity of higher education institutions to address local problems; (3) expanding service-learning programs and outreach activities in rural communities; (4) establishing strong collaborations and partnerships between academia and African governments and local, regional, and continental intergovernmental agencies such as the Inter-University Council of East Africa, the African Union, and IGOs and NGOs; and (5) working together to leverage resources collaboratively from different sources, including USAID, the Carnegie Corporation of New York, FAO, the African Union, and national governments.

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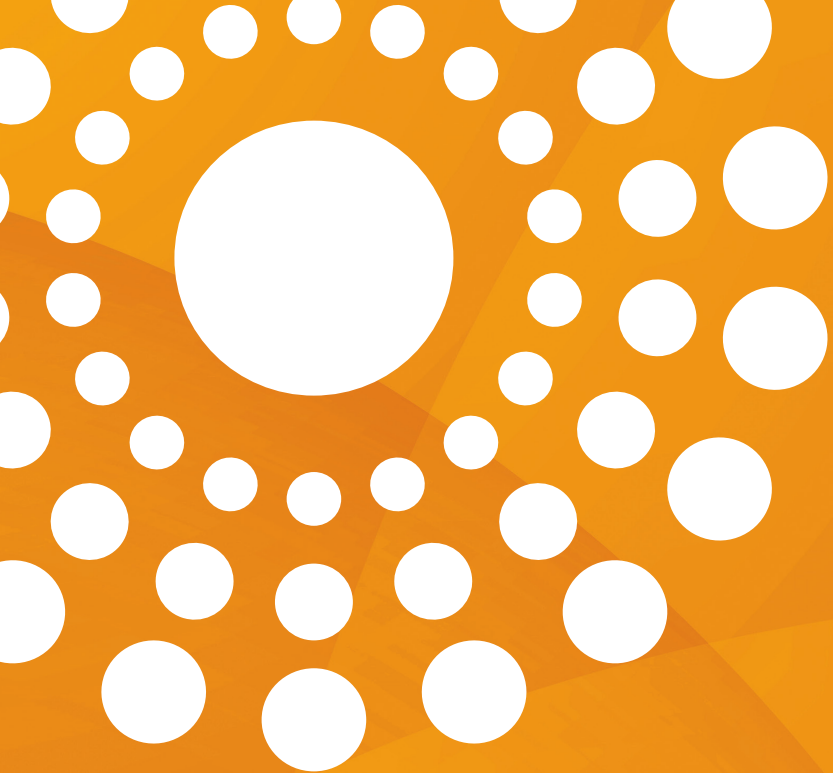
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- Other African and North American institutions mentioned in the paper.

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