

This case study was one of two runners-up in BBSRC's Impact Writing Competition 2019. The competition invited PhD and early-career researchers to submit a case study showcasing social or economic impact arising from BBSRC investments, providing experience of writing about science for a policy audience. This entry was written by Carol N. Ibe, PhD student at the University of Cambridge and founder of the JR Biotek Foundation.

Capacity building in African tertiary education institutions: a neglected but much-needed intervention for food security in Africa by Carol N. Ibe.

The United Nation's Sustainable Development Goal (SDG) 2 is to "Achieve zero hunger by 2030", but how can African nations achieve this with very limited or no investments or plan for capacity building in tertiary education institutions across the continent?

Africa is rich with natural and human resources, yet it is one of the poorest continents in the world. According to the United Nations Food and Agriculture Organization, there are about 333 million hungry people in Africa, with 1 in 4 people being undernourished. The poverty gap is widening, presenting generations with little or no hope for the future.

Africa's population will double to 2.4 billion people by 2050, emphasizing the urgent need for increased food production on the continent. Agriculture is a major driver of Africa's economic development because it employs a large proportion of the population, especially in rural areas where farming is a primary source of food, income and employment.

Agricultural research and innovation can help tackle food and nutrition insecurity in Africa, but there is currently a severe lack of capacity on the continent. A 2017 report published by the World Economic Forum on Africa suggests that Africa does not have enough scientists to tackle its own problems. Compared to the United States and the United Kingdom that have more than 4,000 researchers per one million people, the report indicates that Africa only has 198 researchers per one million, suggesting that the continent needs one million new

PhDs to achieve the world average for the number of researchers per capita.

Presently, many African universities do not have the basic resources and facilities needed to support the next generation of African scientists. This chronic impoverishment has created a huge gap in scientific knowledge between Africa-based scientists and their counterparts in developed nations and is limiting many intelligent students in African universities to compete globally, as well as to contribute to the continent's sustainable development. What must we do to effectively address this chronic problem?

The Case Study:

Molecular Laboratory Training Workshop:

a capacity building project funded by the BBSRC-GCRF IAA Fund, University of Cambridge (2016/2017).

Carol Ibe, a PhD student and Gates scholar at the University of Cambridge's Department of Plant Sciences, set up the JR Biotek Foundation, a student-led non-profit organization to train Africa's next generation of scientists. Carol was born in the United States but grew up in Nigeria where she did her undergraduate degree. When she left Nigeria in pursuit of a master's degree at the Georgetown University in Washington, DC. years ago, she realized that her undergraduate degree did not prepare her for the next steps in her academic career. When others were well on their way, Carol was one hundred steps behind. This frustration led her to start the JR Biotek Foundation, which designs and provides hands-on scientific laboratory training courses and academic resources to strengthen research and innovation in tertiary education institutions across Africa.



Carol Ibe, left, set up the JR Biotek Foundation, a student-led non-profit organization to train Africa's next generation of scientists.
Image: JR Biotek Foundation.

In partnership with the University of Cambridge's Department of Plant Sciences, Carol and other early-career researchers (ECRs) in Plant Sciences organized a Molecular Laboratory Training Workshop involving 17 outstanding Africa-based PhD early-career agricultural researchers from six African countries in Cambridge in March 2017. Candidates were selected based on their involvement in agricultural research and/or teaching in a university in Africa; a clear need to acquire new knowledge and laboratory skills to improve their research and teaching; and strong intellectual ability, leadership potential and the passion to improve the lives of others in Africa through research and innovation.

The workshop equipped the African ECRs with in-depth theoretical and practical knowledge in molecular biology, plant virology and pathology, plant-microbe interactions, plant breeding, bioinformatics and scientific writing and presentation. They visited research and teaching facilities, connected with their research colleagues from Africa and Cambridge, and participated in the 1st edition of the 'Bio-innovation for Africa' pitching challenge.

Bio-innovation for Africa Pitching Challenge

This initiative was developed to encourage African ECRs to become more proactive in finding practical solutions to some of the most pressing challenges faced in Africa. Seven finalists (workshop participants) were selected, mentored and given the opportunity to pitch their innovative products and/or services to a panel of judges. The candidates worked in teams to propose ideas on how hunger and poverty can be effectively alleviated in rural communities in Africa.

For instance, Maryam and Macsamuel pitched their product 'Chemfree-Pea', a chemical preservative-free cowpea that will reduce death occurrences linked to the consumption of chemically preserved cowpea in Nigeria. Jacob and Ruth proposed the idea of producing environmentally-friendly biofertilizers using local strains of arbuscular mycorrhizal fungal spores to help smallholder farmers in rural communities in Ghana and Kenya to improve crop yield and income generation. Bolaji Thanni, who won the pitching contest, set up a non-profit organization called Advocate for Clean Climate and Environment (ACCE Nigeria), which provides sustainable strategies and solutions to the looming climatic issues affecting rural and marginalized populations in Nigeria. Her organization's campaigns are making a difference across universities and rural communities in Nigeria.

How Successful Are We?

The success of the first BBSRC-GCRF IAA funded Scientific Laboratory Training Workshop organized for Africa-based agricultural researchers at the University of Cambridge in 2017 led to subsequent capacity building-focused workshops.

The second workshop was held in Cambridge in March/April 2018 and involved 17 ECRs from six African nations, of which 15 PhD students were fully sponsored to attend.

Like the first edition, the candidates were encouraged to participate in the 'Bio-innovation for Africa' pitching challenge, where they worked in teams to propose innovative solutions to problems in agriculture and food security, education and the environment in Africa. The winning team won a prize of £1500 for their sustainably produced seeds enterprise EcoSeed, which the two PhD students from Benin had started with money they had saved from their scholarships. The second runner up was awarded £500 for his 'One Village One Poultry Initiative', which he started to help create employment opportunities for the youth in rural communities in Kenya.

Reach & Teach Science in Africa

Following two successful scientific laboratory training programmes and bio-innovation pitching challenges, we have recently launched the 'Reach & Teach Science in Africa' initiative, a large-scale capacity building project designed to reach, teach and provide relevant academic resources to 1,000 Africa-based early-career agricultural researchers by 2029. Our first project is a Molecular Biology Training & Open Labware Building Workshop taking place at the University of Abomey-Calavi, Benin Republic in early April 2019. 100 early-career agricultural researchers from 19 African nations have been selected to participate in the workshop, which attracted 900 applications from more than 30 African nations.

Summary

Adequately investing in capacity building in African tertiary education institutions can help the continent achieve food and nutrition security. This will, however, require the cooperation of all key stakeholders including African governments, development partners, research councils and funding agencies in developed countries. Remember that if Africa can feed itself, it can feed the rest of the world because it has the potential to do so.

REFERENCES

- 1 There are not enough scientists in Africa. How can we turn this around? <https://www.weforum.org/agenda/2017/05/scientists-are-the-key-to-africas-future/>
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