

Mapping UNSW Impact Global Development

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| Primary SDG | 4: QUALITY EDUCATION |
| Broad theme | Exchanging knowledge around agrifood science and technology |
| Research | A short-term immersive student exchange focussed currently on agricultural technology and innovation |
| Impact region | Uganda |
| Faculty | Engineering |
| School/Institute | Chemical Engineering |
| Academic | Associate Professor Julian Cox |
| Project partners | Gulu University, Faculty of Agriculture and Environment |
| Related SDGs | 15: Life on Land, 11: Sustainable Cities and Communities |

Elevator pitch

To help students in Uganda and at UNSW to gain real world knowledge and experience, Julian and partners have created a 'summer school' exchange where students are exposed to farming practices and challenges, and develop solutions and innovations to help farmers, enhancing their skills and job prospects.

The Challenge: Students lack real world experience

A 2016 survey by the Inter-University Council of East Africa showed that at least half of the graduates from East African universities lack employability skills, technical mastery and basic work-related capabilities. Of the five countries surveyed, Ugandan graduates were the least equipped, with 63% of graduates lacking job market skills. Students need more practical experience to complement their studies.

UNSW's solution: Get students to go on exchange and come up with real world solutions

Julian and partners have initiated a summer exchange program between UNSW Engineering, Gulu University's Faculty of Agriculture and Environment, and local businesses and farmers in and around Gulu and the western slopes of NSW. The exchange aims to provide students from both universities opportunities to learn from each other, academic staff and communities during short-term mobility experiences.

In 2017, Julian took ten UNSW students to Gulu University and surrounding agricultural enterprises. They observed farming practices and looked at ways to innovate at the farm level, including building a bridge for cows to cross a creek and ideas for feed mixing equipment (see below). During this pilot experience, UNSW students were asked to engage with a farming community and collaborate with Gulu students. This exchange resulted in a number of ideas for UNSW student-led projects:

- Bugiso Coffee Project: UNSW and Gulu students have started an enterprise for which students source green coffee beans from Ugandan farmers at Fair Trade prices. They then transport the beans to Australia where they are roasted and ground before being sold to corporate clients. The operation is not-for-profit, with proceeds reinvested in the Ugandan coffee industry

- RiceCycle: In this project agricultural wastes such as rice husks are converted into energy, and the ash is used in the manufacture of construction materials. By connecting small farmers with providers, the sale of the materials will provide cheap, sustainable energy to those who need it most
- FarmConnect: This project aims to create a web-based app which farmers can use to obtain information, such as weather reports and, ultimately, communicate with the community around, for example, the sharing of equipment, information and other resources. The app will act as a virtual ecosystem for farmers where they can help and support each other. Many farmers and communities already use smartphones
- Other ideas: Students produced a draft design for an automated chicken feed mixing system. Currently the mixing is done by hand and is laborious. A drum mixer will reduce the time a farmer has to spend mixing, freeing them up for higher quality work and thinking.

Nine students and two staff, from Gulu University's Faculty of Agriculture and Environment, visited UNSW in June 2018. They engaged in a wide variety of activities, including hands-on workshops with UNSW Engineering staff and students, and spending time at agricultural enterprises in the Boorowa area to learn about modern farming practices. This experience inspired them to develop and strategize ideas for implementation back in Uganda.

Julian hopes to continue the exchange, in at least one direction each year. But Gulu students, lacking funds, need support to make it to UNSW. A corporate sponsor or other forms of philanthropy would be welcomed. He is currently talking with Boorowa Rotary about providing a scholarship for Gulu students. Julian and UNSW Engineering are also considering developments in academic programs around renewable energy, and his own area of food safety. He sees that, ideally, UNSW Engineering will help Gulu University create an engineering school focused on renewable energy.

The Impact: Students gain real world experience, Ugandan farmers set to benefit

The Summer School is an immersive transformative experience for both sets of students, providing them with an opportunity to learn about real-world challenges in agriculture and to develop viable solutions. This experience adds to the depth of their university-based learning, readying them for jobs in the real world. While in Uganda, UNSW students built a bridge for cows to cross a creek, helping a local farmer to afford his cattle greater access to feed. UNSW and Gulu student project ideas have the potential to do a lot more for Ugandan farmers, including the creation of a network where farmers can source knowledge and equipment, and the use of waste materials (rice husks) to create much needed energy, saving the farmers from having to buy and burn wood. The exchange could also lead to further collaborations between the two universities, such as research work and the creation of a renewable energy school at Gulu. Both initiatives would serve to lift the employability of Gulu engineering students and the quality of university degrees at Gulu.

Researcher

Julian Cox is an Associate Professor of Food Microbiology, and formerly the Associate Dean (Education) in UNSW Science and Associate Dean (International), in UNSW Engineering. Julian has extensive and award-winning teaching experience in food microbiology, quality assurance, rapid methods, and graduate attributes. His research activities focus on food microbiology and food safety, including rapid methods for the detection and characterisation of microorganisms associated with foods, the biology, ecology and management of foodborne pathogens and food safety systems and culture. As a first-in-family graduate, Julian is passionate about the value of higher education and international experiences, and the inspiration and aspiration sparked through them, especially among those less privileged.

Ben Falkenmire 15.08.18