
UK research and innovation overseas:

A snapshot of University Alliance activity in developing countries

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University Alliance Spotlight Report

 **University
Alliance**

Making the difference

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Front page image: The Centre for Sustainable and Resilient Communities at the University of Huddersfield is helping to maintain the tropical forests of Ethiopia and improve the livelihoods of local communities.

Introduction: research and international development

The use of academic research to tackle problems in developing countries is an important aspect of international development. It informs policy and practice overseas and directly assists people in extreme poverty. The body of evidence derived from research can improve the quality and reach of international aid. It ensures that support from donor countries can be targeted more effectively and achieve lasting results.

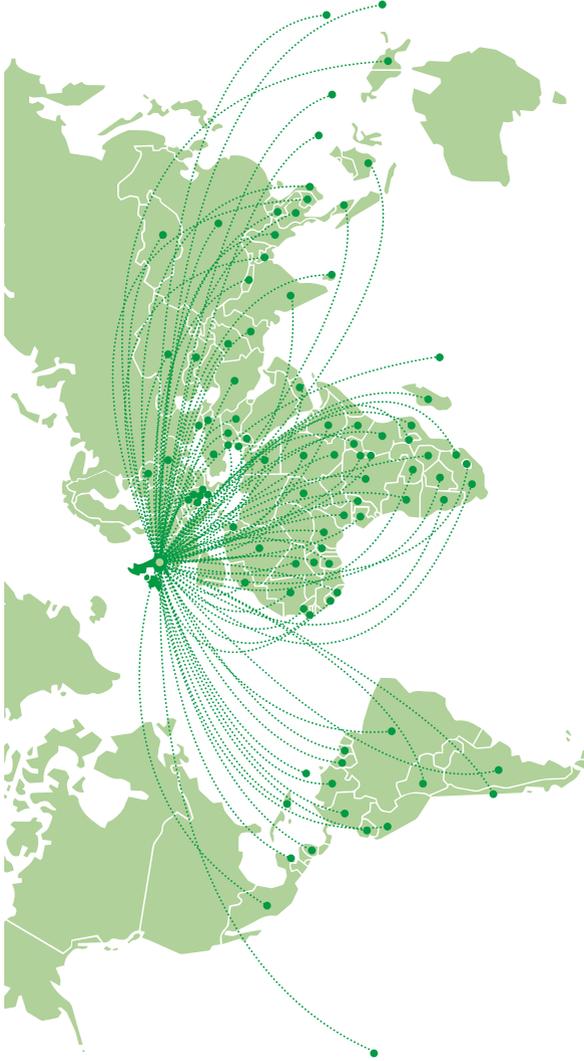
In the UK, research is at the forefront of the government's development agenda. The Global Challenges Research Fund (GCRF), announced as part of the 2015 aid strategy, is supporting multi-disciplinary projects across 11 challenge areas, covering everything from food security to viral threats in the developing world. Amounting to £1.5 billion by 2020, the fund will make up a significant portion of the government's overall budget for science and innovation, and is therefore a top priority for universities.

Between them, the 20 institutions in University Alliance are already working in 95 countries eligible for Official Development Assistance (ODA). As a result, they are well placed to fulfil the objectives of GCRF, as well as other funds aimed at reducing global poverty through the translation of knowledge.

To understand better the work of our members overseas, we conducted a survey of their activity in ODA listed countries. The findings are presented in this Spotlight Report.

University Alliance research activity in developing countries

Mapped out to the right are 95 low and middle income countries in which University Alliance members reported existing research and knowledge exchange partnerships.* The DAC list of ODA recipients is reviewed every three years and contains a total of 146 countries and territories.



* Based on a survey of University Alliance members (Oct 2016-Jan 2017). The countries and territories highlighted on the map were cited at least once by respondents.

Top 10 countries with an Alliance footprint

University Alliance academics and practitioners are working across the developing world. But these are the countries where our footprint is largest*:

| | | | | | |
|---|---|--------------|----|---|---------|
| 1 |  | China | 6 |  | Vietnam |
| 2 |  | India | 7 |  | Kenya |
| 3 |  | Brazil | 8 |  | Nigeria |
| 4 |  | Malaysia | 9 |  | Mexico |
| 5 |  | South Africa | 10 |  | Uganda |

* Based on survey of University Alliance members (Oct 2016-Jan 2017). 'Footprint' refers to the number of institutions working in a particular country or territory. For example, 16 members said they are working on research projects in China while seven reported activities in Uganda.



Researchers at the University of South Wales have created a documentary on the lives of an all-female Muslim football team in Zanzibar. *Zanzibar Soccer Queens* raised vital questions about the role and status of Muslim women in Africa.

Our research publication record

Between 2011 and 2016, University Alliance members produced over 13,000 publications with institutions in the developing world.

| | Co-authored publications | Countries worked in | Institutions worked with |
|-------------------------------|--------------------------|---------------------|--------------------------|
| Least developed countries | 206 | 18 | 45 |
| Other low income countries | 95 | 2 | 23 |
| Lower middle income countries | 2063 | 21 | 332 |
| Upper middle income countries | 10,834 | 38 | 913 |
| Total | 13,198 | 79 | 1,313 |

Source: SciVal (2011-2016)

But publication figures only tell part of the story...

The scope of University Alliance activity in developing countries is much broader than the production of research papers. The exchange of knowledge through collaboration with industry and enterprise, participation in international networks, staff exchanges and a host of other activities ensures that university research and innovation is applied in real world contexts and reaches a wider global audience.



Nottingham Trent University is researching how advanced technology such as energy saving LED lights could improve global food security.

Examples of University Alliance research activity in developing countries

These case studies highlight the work of Alliance universities corresponding with each of the 11 GCRF challenge areas.

Secure and resilient food systems supported by sustainable agriculture

- **Nottingham Trent University** | By 2050, it is expected that two-thirds of the world's population will live in cities and global food demand will have risen by 70%. Urban agriculture research at NTU uses advanced technology such as vertical growing systems with hydroponics and aeroponics, energy saving LED light and automated control systems to ensure a resilient and high quality food supply.
- **University of Central Lancashire** | Working with academic partners and rural communities in Pakistan, researchers are evaluating the effectiveness of the biofortification of staple crops with micronutrients as a low cost, long term solution to micronutrient deficiencies on a population scale. The team are also evaluating novel methods and new technologies for assessing nutritional status in low resource, field settings.
- **University of Greenwich** | The Natural Resources Institute (NRI) works on global food security, sustainable development and poverty reduction, often in partnership with developing country organisations. It is currently collaborating with the University of Reading on the development of enhanced communications approaches and improvements to banana production systems in Uganda.
- **University of Huddersfield** | The Centre for Sustainable and Resilient Communities is helping to maintain the tropical forests of Ethiopia and improve the livelihood of local communities. Its work on sustainable forest management and business development has transformed over 100,000 hectares of degrading forest into a working, profitable resource and created 18 new enterprises serving around 100,000 people.

Sustainable health and wellbeing

- **Coventry University** | A collaborative partnership with the British Council and Cairo University is improving the skills and knowledge of pharmacists in Egypt, enhancing people's health and economic wellbeing.
- **Plymouth University** | The spread of Ebola is being controlled and prevented through 2D and 3D simulations in a project being trialled in Liberia and Sierra Leone. Researchers use the simulations to teach local health carers and the public about caring for sick family members as well as disinfection and personal protection.

Inclusive and equitable quality education

- **Coventry University** | By studying access to education for visually impaired young people with albinism in Malawi, researchers are able to understand why this vulnerable group is not attending school and how to enhance the quality of life for people with the condition.
- **The Open University** | Teacher Education in Sub-Saharan Africa (TESSA) is transforming the education of primary and secondary school teachers. It provides a rich resource of materials produced by African authors and draws on The Open University's teaching expertise.

Testing out a urinal which powers microbial fuel cell stacks to generate electricity for indoor lighting. The 'pee power' technology has been developed by Bristol Robotics Laboratory at UWE Bristol in partnership with Oxfam.



Clean air, water and sanitation

- **Nottingham Trent University** | Working with the Chinese Academy of Sciences, the university has developed a scalable, sustainable and cost-effective technology to tackle toxic algal blooms which affect the public health of three billion people in 45 countries. The technology uses natural polymer products to modify local soil, sand and clay particles. Adding the modified solid particles loaded with oxygen nanobubbles to natural waters removes algal blooms, improves water quality, remediates sediments and leads to ecological restoration.
- **University of Brighton** | Brighton's researchers and the University of Malawi are investigating safe water provision in rural areas and ways of reducing water-related illnesses. The project combined Malawian geotechnical expertise and local knowledge with UK water quality expertise and has resulted in improved design of shallow wells in Malawi, serving a population of 180,000 people.
- **UWE Bristol** | The Air Quality Management Resource Centre is working with Newcastle University to improve air quality in Delhi, India. A NERC/MRC funded project – CADTIME: Clean Air for Delhi Through Interventions, Mitigations and Engagement – will help to mitigate air pollution in the second-most polluted major city in the world.



The Universities of Brighton and Malawi are investigating safe water provision in rural areas and ways of reducing water-related illnesses.

Renewable energy and materials

- **University of Portsmouth** | Mathematicians from Portsmouth and the University of Estadual Paulista in Brazil have created a model to overcome logistical problems relating to producing biomass from sugar cane. The model aims to ensure the cane is harvested at maximum maturation to increase its potential as an alternative and renewable source of energy.
- **UWE Bristol** | The Bristol Robotics Laboratory at UWE Bristol, in partnership with Oxfam has developed a urinal that powers microbial fuel cell stacks to generate electricity for indoor lighting. 'Pee-power' technology is expected to provide a cheap and sustainable way to light toilet cubicles in refugee camps and disaster zones which are often dangerous places for women.

Sustainable livelihoods supported by strong foundations and infrastructure for sustainable, inclusive economic growth and innovation

- **Sheffield Hallam University** | Working with a farming co-operative in India, researchers have developed a mobile phone system for on-the-spot local agricultural advice which – in trial – helped over 100 farmers avoid critical threats to their crops and livelihoods. New methodologies were later used to micro-finance IT projects in India which generated savings for over one million people.

Resilience and action on short-term environmental shocks and long-term environmental change

- **Manchester Metropolitan University** | The university is undertaking a European Union funded project which uses Geographic Information Systems and Remote Sensing technologies to assess land degradation in South Africa. The LanDDApp project is identifying areas that are undergoing degradation processes such as bush encroachment, and helping agencies mitigate their effects.*

* This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 334327.

- **University of Huddersfield** | The Global Disaster Resilience Centre focuses on meeting human crises such as the Sri Lanka Tsunami in 2004 where communities needed to be rebuilt physically, economically and socially. The centre also considers how to protect people and their environment and reduce their vulnerability to future catastrophes.
- **University of Salford** | The Chernobyl accident site is being used as a laboratory to study the effects of radiation on wildlife. Using hundreds of motion-activated camera traps and bioacoustics, the research team found a thriving community of large and medium-sized species, challenging previous work suggesting mammal numbers had declined since the radioactive disaster.

Sustainable cities and communities

- **Nottingham Trent University** | The Remourban partnership involving Nottingham, Valladolid in Spain and Eskisehir in Turkey is developing a model to transform cities into Smart Cities. Partnerships are being formed with local leaders to engage and empower citizens, helping to reduce greenhouse gas emissions and energy consumption, and achieving improvements in the urban environment.
- **Oxford Brookes University** | Researchers in planning and real estate management are collaborating with Brazilian colleagues to understand the impact of everyday immobility on health and wellbeing on different social groups in Brazil and the UK.



Fitting motion-activated cameras in the Chernobyl accident site are helping Salford researchers to understand the effects of radiation on wildlife. (Credit: *TREE project*, www.ceh.ac.uk/TREE)

Understand and effectively respond to forced displacement and multiple refugee crises

- **Kingston University** | Researchers are exploring the complex relationship between migration, sex work and trafficking across three continents, in collaboration with Aix Marseille University in France. The SEXHUM (Sexual Humanitarianism: Migration, Sex Work and Trafficking) project will analyse migrants' own understandings and experience of exploitation and trafficking and look at how the different anti-trafficking laws and intervention policies in those countries impact on migrants working in the sex industry.
- **Plymouth University** | Researchers are studying industries that have survived among Syrian refugee communities in the neighbouring state of Jordan since 2011. The project aims to train people in the establishment and successful operation of social enterprises.
- **University of Hertfordshire** | The university partnered with Extremis Technology which develops innovative transitional shelters for use during disaster relief. Researchers at Hertfordshire carried out independent, high-quality testing which validated the performance of these shelters under extreme weather conditions.

Reduce conflict and promote peace, justice and humanitarian action

- **Teesside University** | The Centre for Fascist, Anti-Fascist and Post-Fascist Studies examines the historical development of far right politics and culture. It provides expert analysis and insight into the changing nature of these phenomena, as well as acts of terrorism and extremism around the world.
- **University of Portsmouth** | Portsmouth is working with partners in Rwanda, Sudan, South Sudan, Nepal, Pakistan and Myanmar to tackle post-conflict issues such as forced displacement, genocide and civil violence.

Reduce poverty and inequality, including gender inequalities

- **Liverpool John Moores University** | The university is working with an NGO in Nepal which has gathered demographic, migration and

health information on over 2,000 migrant Nepalese women. An electronic database serves as a tool to help improve the health and economic status of migrant women and reduce their vulnerability to exploitation.

- **University of South Wales** | Researchers created a documentary on the lives of an all-female Muslim football team in Zanzibar. The film has encouraged more women to get involved in sport and raised important questions about the role and status of Muslim women in Africa.

Who supports this activity?

Universities receive funding for international research and knowledge exchange from a wide variety of sources. Those commonly cited in our survey are included in the word cloud below.



Researchers at Sheffield Hallam University worked with a farming co-operative in India to develop a mobile phone system, called Kheti, which delivers local on-the-spot agricultural advice to help protect crops and livelihoods.

A message to UK government and funders

Given the importance of research and innovation for Britain's diplomatic and humanitarian efforts abroad, it is essential that we get the funding system right. This means supporting research excellence wherever it exists – recognising that the higher education sector as a whole contributes to the strength of UK research and innovation. GCRF and other public funds should be allocated through open competition.

Important too is the availability of different sized grants for development projects. In view of the consolidation of the seven Research Councils into UK Research and Innovation, there may be a temptation to move towards fewer, larger grants that go to established groups and larger institutions only. A supply of flexible funds should be set aside for smaller bids to ensure innovation and dynamism within the sector.

Finally, GCRF presents an opportunity to grow the capability of UK research by supporting PhD students and early career researchers who can later build on their international experience. Growth in overseas capabilities, on the other hand, can be achieved by training partners for the adoption of research projects. University Alliance is keen to work with government and funders to ensure the mechanisms for delivering global challenge funding achieve maximum impact.

Image (opposite page): Coventry University researchers are studying access to education for visually impaired young people with albinism in Malawi to help enhance their quality of life.



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We are universities with a a common mission to make the difference to our cities and regions. We use our experience of providing high quality teaching and research with real world impact to shape higher education and research policy for the benefit of our students and business and civic partners. We innovate together, learn from each other and support every member to transform lives and deliver growth.

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