



Department for  
Business, Energy  
& Industrial Strategy

# Newton Fund and Global Challenges Research Fund Annual Report 2018–2019



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Collecting buriti palm fruits in Brazil  
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## Foreword by the science minister

It feels anachronistic to look back on our work in 2018–19 while we are in the midst of the pandemic affecting the lives of so many people. Teams of UK and international researchers are still working hard to find a way to overcome it, and we have every faith that they will. It is so encouraging to see our community of researchers and innovators playing their part and therefore I think it is right to recognise and celebrate their past efforts and achievements because without them we wouldn't be in the strong position we are in now to fight COVID-19.

Research and innovation lead to economic growth and play a decisive role in delivering the Sustainable Development Goals. In recent decades, significant progress has been made in improving people's health, making the world a better place for women, designing laws that foster open and just societies, and protecting our planet. But we can and must do more.

UK Official Development Assistance allows us to address key development challenges such as human health, food security and climate change. We are improving lives and creating opportunities for people in low and middle income countries, as well as keeping our research and innovation community at the cutting edge. It's a mutually beneficial relationship that focuses on development impact.

2018/19 was an incredible year. We launched 12 pioneering research hubs for transformative research into complex problems such as the sustainable use of our oceans, the challenges posed by migration, and the decline of biodiversity. We also supported the first cohort of African Independent Research Fellows to establish independent careers, and we celebrated five years of the highly successful Leaders in Innovation Fellowship, which has supported over 1000 innovators in Newton partner countries.

My department is the second largest government spender of Official Development Assistance. This is a huge privilege and responsibility. We continue to listen to the development and research communities; learn from others and improve the way we do things.

This report is part of our commitment to manage our funds in an open and transparent way. I am delighted that in 2019 we hit our goal to achieve a Good rating for transparency according to independent assessors and we will continue to build on this in 2020.

In this report we explain our approach and some of our many successes in 2018/19 in what are often very complex and challenging scenarios.

Together with our many partners in the UK and across the world, my department will continue to deliver outstanding research and innovation for the global good.

### Amanda Solloway MP

Minister for Science, Research and Innovation

“We continue to listen to the development and research communities; learn from others and improve the way we do things”



## Equitable Partnerships

The recurring theme of this report is fair partnerships - that is the principles of putting poverty reduction first, investing in relationships, breaking down hierarchies and a commitment to transparency. These principles, among others, are at the heart of the Global Challenges Research Fund and the Newton Fund.

# Achieving progress together through fair and equitable partnership

Fair partnerships exist at several levels of the funds - from the relationships between individual researchers and communities, to funding partners, as well as governments. This is giving all stakeholders a better understanding of global challenges and how to tackle them as well as insights and evidence to inform development practice and policy. Look out for spotlights on equitable partnership throughout this report.

Research and innovation underpin human progress and have played a significant role in helping to address global development challenges by improving our understanding of human and animal health, climate change and sustainable food supply – and applying practical, evidence-based solutions.

Substantial advancements have been made in recent decades; vaccines have eradicated small pox, oral rehydration therapy has saved the lives of millions of people, breeding high yielding varieties of wheat and rice has transformed food security, water purification has reduced risks of epidemics after natural disasters, and mobile phones have improved access to markets and helped strengthen urban-rural family links.<sup>1</sup>

Tackling such problems requires international cooperation. The UK has committed to strengthening collaboration with other countries to help deliver the Sustainable Development Goals (SDGs) adopted by United Nations Member States in 2015. In the same year the *UK Aid Strategy* called on the skills and expertise from across government to tackle the diversity of challenges the world faces.

To bring an overall perspective on the funding, expertise and experience of all parts of HM Government, the Strategic Coherence of ODA-funded Research (SCOR) Board was formed. It provides coordination for the UK's ODA-funded research to try and maximise impact and ensure the UK is a leader in international development.

Collectively, Official Development Assistance (ODA) investments help the world's poorest and most vulnerable, whilst developing the capabilities of individuals and communities around the world, protecting and promoting national security, and strengthening international relations.

1. Conway, C. & Waage, J (2010) Science and Innovation for Development. UKCDS, London.

The Department for Business, Energy and Industrial Strategy (BEIS) has two complementary research and innovation ODA funds:

### ■ **Newton Fund**

supports bilateral and regional research and innovation partnerships between the UK and selected middle income countries agreed at a national level. The aim of this is to address specific global development challenges and build research and innovation capacity. It operates on the basis of matched funding, with partner countries contributing similar resources to support the partnership. In 2018/19 the Newton Fund spent £116m, up 14% on the previous year

### ■ **Global Challenges Research Fund**

provides dedicated funding to research focused on addressing global challenges which most significantly impact upon developing countries. It achieves this by supporting challenge-led disciplinary and interdisciplinary research, strengthening capability for research and innovation within low and middle income countries, and providing an agile response to emergencies, where there is an urgent research and on-the-ground need. In 2018/19 the GCRF spent £275m, up 33% on the previous year

From **2014-21**  
a UK investment of up to  
**£735 million**  
with 'match' effort from  
partner countries

From **2016-21**  
a UK investment of up to  
**£1.5 billion**

## UK investment is supporting research and innovation in at least 73 countries through Newton Fund and GCRF

**The Newton Fund has a match effort which is financial and/or in-kind depending on circumstances.**

From 2020/21, the UK's Newton Fund partnerships with China and India will have a renewed focus on delivering global development impact. This means that the UK will be working in partnership with these two countries respectively to address development challenges that are relevant to developing countries around the world. GCRF activity between these countries will also adopt this focus.



### A breakdown of ODA spend in 2018/19

Afghanistan	Dominica	Madagascar	Solomon Islands
Argentina	Ecuador	Malawi	Somalia
Bangladesh	Egypt*	Malaysia*	South Africa*
Benin	Ethiopia	Marshall Islands	South Sudan
Bhutan	Former Yugoslav Republic of Macedonia	Mexico*	Sri Lanka
Bosnia and Herzegovina	Gambia	Mongolia	Sudan
Botswana	Georgia	Montserrat	Tanzania
Brazil*	Ghana	Morocco	Thailand*
Burkina Faso	Grenada	Mozambique	Tunisia
Cambodia	Guatemala	Myanmar	Turkey*
Cameroon	Guyana	Namibia	Uganda
Cape Verde	Haiti	Nepal	Ukraine
Chad	India*	Nicaragua	Vietnam*
Chile <sup>^</sup>	Indonesia*	Nigeria	Zambia
China*	Iraq	Pakistan	Zimbabwe
Colombia*	Jordan*	Papua New Guinea	
Costa Rica	Kazakhstan	Peru*	
Cote d'Ivoire	Kenya*	Philippines*	
Democratic Republic of the Congo	Lebanon	Rwanda	
		Senegal	
		Sierra Leone	

Some projects span multiple countries/regions within continents. Where more than one Development Assistance Committee list country is the beneficiary, these are not included in the map.

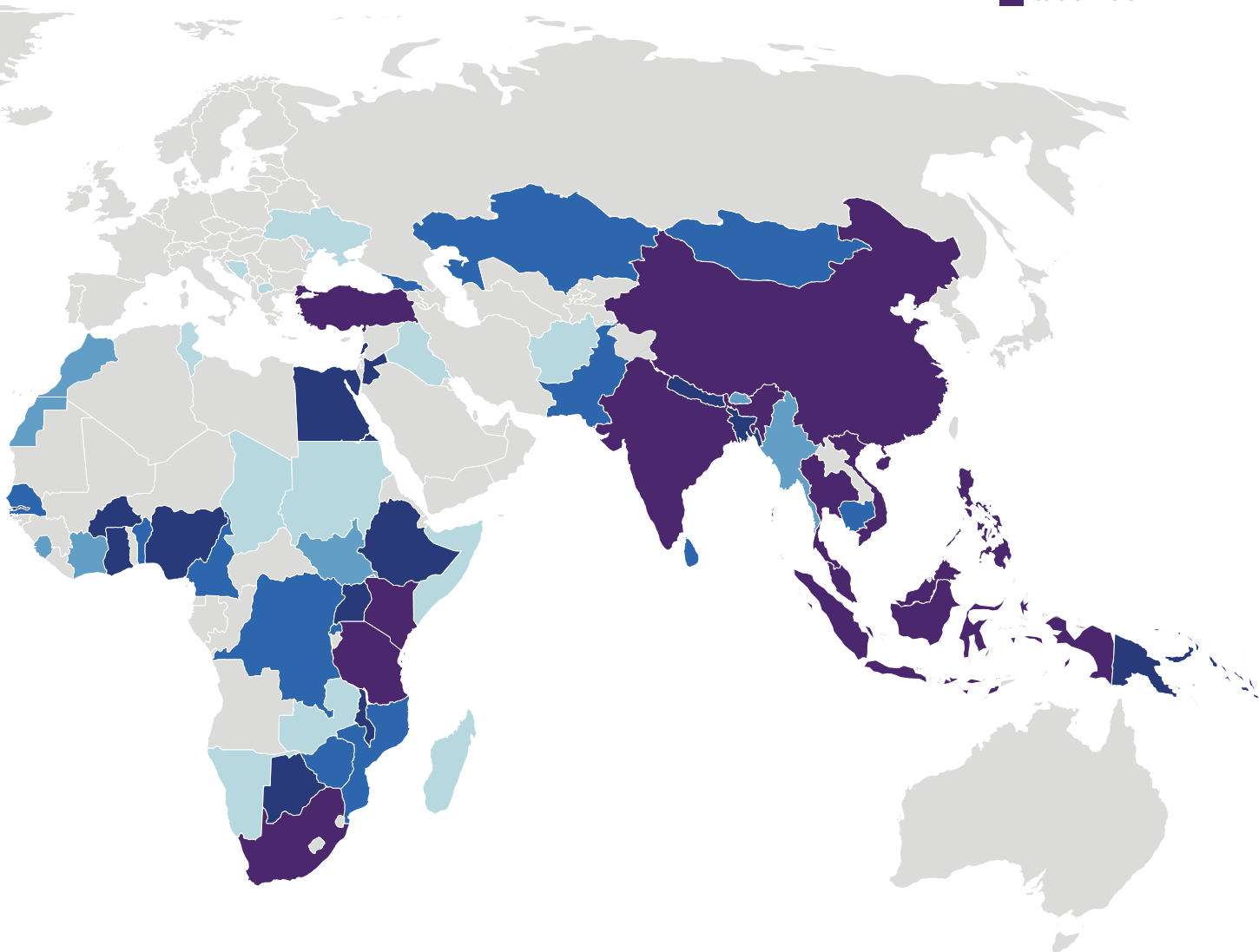
\* Indicates active Newton Fund partner countries.

<sup>^</sup> Chile graduated from the DAC list in 2018 and is no longer an active Newton Fund partner country. Legacy spend here addressed development challenges relevant to developing countries around the world.

This map is for representational purposes and borders are not accurate.

All funds

- £0.0–0.1m
- £0.1–0.2m
- £0.2–0.7m
- £0.7–3.5m
- £3.5 or more





# Global Challenges Research Fund

## Life-changing research for sustainable development

The Global Challenges Research Fund was set up to ensure the UK research community could take a leading role in addressing the big problems faced by developing countries and to use their expertise to pioneer ways of tackling global challenges, promote global prosperity and tackle extreme poverty.

We allocate funding to a range of expert partners, including UK Research and Innovation, the National Academies, the UK Space Agency and the UK Higher Education Funding Councils for England, Scotland, Wales and Northern Ireland. These partners distribute funds to a range of research institutions based on a competitive process and peer review.

### Equitable Partnerships

#### Boosting capacity across global peer review

UK Research and Innovation's International Development Peer Review College is a 300-strong, virtual college of experts from across 53 countries, 95 percent of whom are from low and middle income countries.

Launched in 2018, members of the college provide expert reviews and serve on panels across UKRI's international development portfolio, ensuring developing country perspectives are central to the decision-making process for international development research. To date the College members have reviewed over 200 applications and served on a number of UKRI panels.





## Areas of work

# 1

**Promoting challenge-led interdisciplinary research** including the participation of researchers who are new to international development and bring fresh approaches and innovation.

# 2

**Strengthening capacity for research, innovation and knowledge exchange** in the UK and developing countries through partnerships.

# 3

**Providing an agile response to emergencies** where there is an urgent research need.



## GCRF Highlight

# Tackling intractable challenges

**UK Research and Innovation (UKRI) allocates the majority of GCRF. A key success in 2019 has been the establishment of 12 Interdisciplinary Research Hubs, which aim to develop sustainable solutions to make the world safer, healthier and more prosperous.**



Adolescent advisors in Cape Town, South Africa in an interactive workshop hosted by the UKRI GCRF Accelerating Achievement for Africa's Adolescents Hub.  
© Interfer

The Hubs bring together teams of researchers from different specialisations to focus on intractable development challenges which cannot be solved by a single organisation, discipline or country working alone.

Working in partnership with researchers, governments, international agencies and non-governmental organisations in developing countries and around the globe, the Hubs share knowledge and expertise to develop innovative, sustainable solutions at a local, national and international scale.

The scale and focused nature of each Hub provide a unique opportunity to make lasting impact on international development through collaborative research.

# challenges

# Key facts

Since 2019...

**12** global interdisciplinary research Hubs

**550** researchers

UK investment over **5** years

Spanning **85** countries

**400** unique partner organisations



## Living Deltas Hub

River deltas comprise just one percent of global landscapes yet support over half a billion people. Deltas are vital social-ecological systems, but the terrain and the livelihoods of those who rely on them are under threat from human exploitation, environmental degradation and climate change. Focusing on three deltas in Asia, this Hub will create sustainable equitable livelihoods for delta dwellers and support better policies for sustainable development. The benefits will be felt by disadvantaged communities that live in or near deltas.

## Key facts

**£15.3m**

**13**  
partner  
countries

**39**  
partner  
organisations



Living Deltas  
© Gerard Corsane

## Accelerating Achievement for Africa's Adolescents Hub

In 30 years' time there will be half a billion adolescents in Africa. They possess huge potential to thrive but more than half are trapped in cycles of poor nutrition, poverty, low education, violence and unemployment.

The Hub has been planned with African governments and international agencies including the UN Development Programme, African Union, UNICEF and the World Health Organisation to find the combinations of services with the greatest positive impacts for Africa's adolescents and their children. It will train and support frontline workers to improve services for adolescents across Africa, deliver practitioner training in 34 African countries and support 45 promising young academics and dedicated African policymakers to focus their careers on improving the lives of adolescents and their children.



Adolescent Hub, Sierra Leone  
© Inge Wessels

## Key facts

£18.5m

15  
partner  
countries

56  
partner  
organisations

## Equitable Partnerships

The Hub's work is planned with adolescents themselves. Too many services have failed because they do not appeal to teenagers' aspirations and immediate goals. The Hub will work directly with adolescent advisory groups in Eastern, Western and Southern Africa to co-develop approaches that are not only effective, but also meaningful and fun for those who will use them.

# GCRF Highlight

## Africa's future leaders

**A shortage of research equipment and insufficient funds to employ research staff are common obstacles faced by academics from African countries where, on average, just above 0.4 percent of gross domestic product is spent on research and development.<sup>2</sup>**

**A GCRF-funded programme created by the UK's Royal Society and the African Academy of Sciences has been set up to help talented early-career researchers establish independent careers in research and the chance to become leaders in their field.**

In 2019, the first cohort of FLAIR Fellows (Future Leaders – African Independent Research) were selected. Their research ranges from: developing water purification devices, capturing CO2 and conversion into other useful chemicals, forecasting climate change, and improving yield in vital crops.

The FLAIR programme is already making an impact. Scientists from the African continent are returning from countries such as the UK and USA to continue their careers in African institutions. This is an important output of the programme – taking active steps to mitigate 'brain drain' in Africa. FLAIR fellowships provide opportunities for researchers who have completed postdoctoral training in high income countries to utilise their skills at home, creating an international research culture and strengthened research system in African countries.



FLAIR participants  
© Royal Society

2. <https://tellmaps.com/uis/rd/#!/tellmap/-680879682>

# Cohort 1 Key facts

Awards of up to  
**£150,000**  
over 2 years

**29** Fellows

**22**  
African institutions  
taking part

Spanning **8**  
African countries

## Equitable Partnerships

All research themes are decided by the research fellows themselves. FLAIR fellows gain career development opportunities which include the chance to grow their international networks and access training and equipment in UK-based institutions.



Natural breaks in the genital mucosal barrier that occur during sex have been found to assist the spread of HIV infections. FLAIR is funding Dr Lenine Liebenberg's team to research the changes during sex that occur in genital microbiomes and immune environment to better understand how HIV spreads.

“ This Fellowship not only provides financial support for research, but promotes and encourages professional development along a path from early career researcher to distinguished scientist and authority in the field. Being part of this Fellowship means that I am part of a community of African researchers, and we have bonded as a team.

**Dr Lenine Liebenberg,**  
Centre for the AIDS Programme of  
Research in South Africa.

”



FLAIR Fellows: Lenine Liebenberg and Leopold Tientcheu Djomkam, The Gambia  
© Royal Society



Half of all tuberculosis (TB) cases in West Africa are caused by one strain called *M. africanum bacilli*. This is a different strain from the one which causes most other TB cases around the world. This difference requires tailored therapeutic approaches that account for both the pathogen and human genetic diversities. This FLAIR award will allow Djomkam to expand his research on TB to try and shorten lengthy antibiotic treatment, particularly in West Africa.

“ I am honoured and delighted to receive the FLAIR award as it will accelerate my transition into an independently-funded fundamental/translational infectious disease scientist.

**Dr Leopold Tientcheu Djomkam,**  
UKRI-MRC Unit at the London School  
of Hygiene and Tropical Medicine  
in the Gambia.

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# Challenge Leaders

Challenge Leaders are academics responsible for specific areas of work under GCRF. In 2018/19 the nine Challenge Leaders delivered a range of initiatives aimed at making sure that GCRF as a whole has the greatest possible impact on global development and moves the world closer towards achieving the UN Sustainable Development Goals.

The nine Challenge Leaders work across six challenge areas: Global Health, Food Systems, Conflict, Resilience, Education, and Sustainable Cities.

## Some highlights include:



### Resilience and food systems

Challenge Leaders Mark Pelling, John Rees and Tahrat Shahid had a hand in shaping discussions ahead of the 2019 United Nations climate action summit in New York. Their views and policy briefing fed into a new programme of research dedicated to integrating climate risks into public and private sector decision-making to assure sustainability of food, water, and jobs for the future, as well as to prevent disasters and allow quick recovery when disasters happen, especially for the most vulnerable groups.



### Security, protracted conflict, refugee crises and forced displacement

A meeting held in Addis Ababa, Ethiopia in March 2019, initiated by the Challenge Leader Laura Hammond with contributions from Neelam Raina and Tahrat Shahid, provided a forum for experts from academia and policy to discuss the Horn of Africa's extensive experience of human migration. The meeting highlighted the importance of collaboration between researchers and practitioners, recognising that research-based migration reform is needed at a time when international solidarity is in decline.



### Cities and sustainable infrastructure

In May 2019, Jaideep Gupte organised a symposium with UK Collaborative on Development Research, Department for International Development, Science and Innovation Network, and the Republic of Kenya Ministry of Education, which brought together researchers, government officials, social enterprises and businesses from the UK and Kenya to discuss sustainable development challenges in affordable housing. At the symposium, key issues and opportunities, covering both technological and socio-economic aspects of affordable housing, were set out and discussed to take forward Kenya's policy priorities in this area.

## GCRF case studies

### Building resilience in young people in Latin America

Depression and anxiety greatly increase during adolescence and adolescents who live in big cities more commonly experience stressful events such as conflict, poverty, substance misuse and social isolation. This UKRI-Medical Research Council study is identifying the factors that are linked to prevention or recovery in three large Latin American cities and will identify which resilience factors prevent depression and anxiety.

### Engineering innovation for public health

A South African electrical engineer has won the GCRF-supported Africa Prize run by the Royal Academy of Engineering. Neo Hutiri and his team developed Pelebox, a smart locker system designed to dispense medicine to patients with chronic conditions. Pelebox is used at public healthcare facilities in South Africa, cutting down on long queues and easing pressure on the healthcare system.

### Supporting women and girls into leadership

The Language, Gender and Leadership Network, funded by the UK's Arts and Humanities Research Council, part of UK Research and Innovation, aims to enhance economic development and the welfare of women and girls by analysing the key challenges facing them in becoming successful leaders in businesses and politics in Africa and beyond. Ultimately the network will inform and influence policy-makers of the gender-based inequality challenges currently being faced, and equip communities of women and girls with the aspirations, role-models and beliefs required to succeed in future leadership positions.

### Satellite-based dengue fever forecasting

D-MOSS, Dengue forecasting MOdel Satellite-based System, is a dengue fever early warning system for Vietnam being developed by a project funded by the UK Space Agency's International Partnership Programme. The D-MOSS project is developing a suite of innovative forecasting tools that will allow public health authorities to identify areas of high risk for disease epidemics before an outbreak occurs, in order to target resources to reduce spreading of epidemics and improve disease control.

### Earlier diagnosis of breast cancer in Kenya

Breast cancer survival has improved significantly in the UK over the last 20 years, but in lower income countries such as Kenya, increasing survival remains a significant challenge due to a combination of issues such as late stage diagnosis and limited capacity to identify women who would most benefit from endocrine therapies. This award provides a foundation for improved studies to inform the development of improved surveillance, diagnostic tests and treatment for breast cancer in Kenya.

### Improving the seismic safety of historic urban infrastructure

The 2015 Gorkha Earthquake was a humanitarian disaster that caused 9000 fatalities and changed Kathmandu's iconic skyline in seconds, with 403 monuments damaged across its UNESCO World Heritage Site. Representing a key component of tourism in Nepal, and generating 7.6 percent of the country's GDP, their safe rehabilitation is key to reducing risk to lives and livelihoods. Building on north-south partnerships, this British Academy project integrated archaeology with 3D visualisation, geotechnical and structural engineering as well as architectural studies and community engagement to co-produce, pilot and disseminate novel methodologies to enhance the seismic safety of Kathmandu's historic urban infrastructure while preserving its cultural heritage value.

# Newton Fund

## Research and innovation partnerships for sustainable equitable growth



Citizen project engages directly with older citizens and healthcare professionals in São Paulo  
© Dr Peter Sahota

The Newton Fund supports bilateral government agreements between the UK and Brazil, Chile\*, China, Colombia, Egypt, India, Indonesia, Jordan, Kenya, Malaysia, Mexico, Peru, Philippines, South Africa, Thailand, Turkey, and Vietnam.

The distinctive feature of the Newton Fund is the ‘match effort’ from each of the partner countries. This model builds collaboration into the research from the very beginning and has transformed the UK’s relationships with partner countries, helping us to jointly accelerate the impact of our work.

Newton Fund partnerships focus on middle income countries rather than low income and least developed. The Newton Fund offers bespoke approaches to development research in jointly identified priority areas with partner countries. Newton Fund partners are actively involved in the co-design of programmes and projects. Other ODA funds, including GCRF, complement this approach and work with the least developed countries.

### Areas of work

**People:** supporting skills, talent and careers to increase capacity in research and innovation

**Research:** research collaborations on mutually agreed development topics

**Translation:** creative solutions to development challenges and strengthening innovation systems

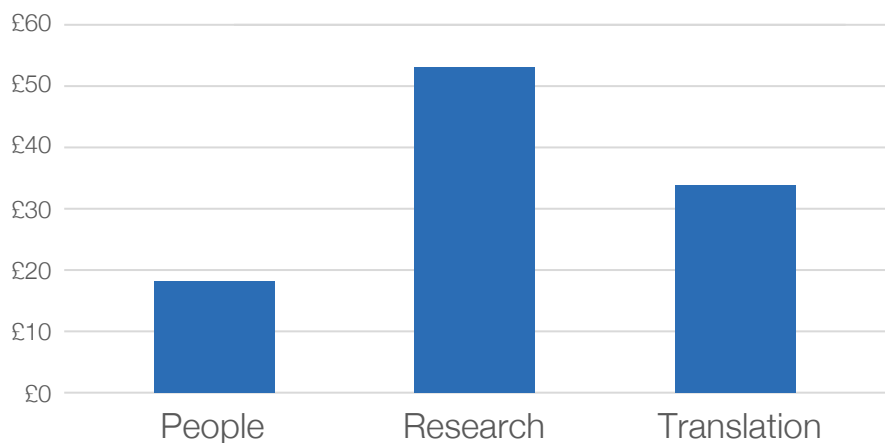


Figure 1. 2018/2019 Newton Spend by Pillar\*\* (£m)

3. <https://www.nature.com/articles/d41586-019-02172-9>

\*Chile graduated from the DAC list in 2018 and is no longer an active Newton Fund partner country.

\*\*Excludes funds allocated to ‘Delivery’ and ‘Monitoring’, and funds not associated with an individual delivery partner. This represents UK investment only.

...The authors appeal for more international assistance — and one of their ideas is for richer countries to provide bespoke funding opportunities for their scientists to work with counterparts in the developing world. Such opportunities exist already, for example, through the UK government’s £735-million (US\$923-million) Newton Fund, and the Chinese government is funding more of its research community to work on scientific projects in low income countries. But both of these funders expect that the governments of recipient countries will provide matching grants, and this is a welcome development.

– **How to make development funds go further,**  
Nature editorial July 2019<sup>3</sup>

## Newton Fund Highlight

# Supporting world-changing innovations from emerging economies

The Royal Academy of Engineering brings together the world's most talented engineers. Its Newton funded Leaders in Innovation Fellowships (LIF) programme works in collaboration with partner agencies in each Newton-partner country, to kick-start the commercialisation of innovations that will improve the social and economic development of emerging economies, and increase the skills and career prospects of those who take part.

Entrepreneurial training for research-driven innovators can be a powerful tool for expanding their businesses. The LIF programme has fostered innovation leadership by supporting 1000 of the world's brightest engineering entrepreneurs from emerging economies across four continents. Between them they have secured over £61 million in business funding. The programme empowers its alumni to commercialise innovations that will contribute to economic and social development in their countries and beyond. Ranging from mapping coral reefs and creating eco-friendly biofuels, to cataract treatment and assistive technology for disabled people - innovations developed by the LIF community are changing almost every industry, in all corners of the world.



LIF sessions in Colombia  
© Royal Academy of Engineering

# innovation



## Solar energy submersible pump

More than 780 million people lack access to safe drinking water. The situation is exacerbated by climate change and growing global water scarcity, which has especially significant negative effects in arid and semi-arid regions. One innovation from LIF fellow Ling Zhou uses solar energy to power a submersible pump for water extraction. A more reliable water supply improves people's living conditions, the national economy, and has great potential for energy saving.

## Improving reproductive health

In Kenya, over 25 percent of women have undergone female genital mutilation (FGM) which has many health effects including recurrent urinary and vaginal infections, chronic pain, infertility, haemorrhaging, difficult labour and childbirth complications. More broadly in Africa, over 150 million women have undergone FGM. Several innovations by LIF fellow, Dr Peter Mwethera, are designed to improve the situation for women: Smugel Gel addresses the problem of vaginal dryness as a result of sexual violence and can also help in childbirth. Smuscan Gel allows the monitoring of a baby in the womb. UniPro is a contraceptive for HIV infection prevention. The products are priced competitively so that they are accessible and affordable to an ordinary person in developing countries and will hopefully contribute to a reduction in the cost of health/medical care in Africa.

## Equitable Partnerships

### Facing weather and climate challenges together

The Weather and Climate Science for Service Partnership (WCSSP) programme brings together the Met Office, UK research institutions and national weather and climate institutions in partner countries to undertake joint research into weather and climate-related challenges. WCSSP Southeast Asia is a regional project currently involving Indonesia, Malaysia, the Philippines and the UK that represents an excellent example of working regionally and delivering direct impact for the people who need it.





## Newton Prize 2018

The Newton Prize is an annual £1 million fund for excellent research and innovation. It allows international research partners to continue working together on solutions that change lives.

In 2018 the prize was awarded to projects in Brazil, Colombia, Chile and Mexico and covered topics including: disaster management, access to safe water, childhood obesity and neglected tropical diseases.

### UK-Brazil winner

#### Improving the lives of the Guarani people by saving the Atlantic Forest

The Atlantic Forest in Brazil is one of the world's richest biomes, home to a large number of species unique to that area. It is fundamental to the physical and cultural survival of the indigenous Guarani people, and to the quality of life of more than 70 percent of the Brazilian population who depend on its water supply. Despite this, nearly 90 percent of the forest has been destroyed to make way for pastures, croplands and urban areas, severely affecting the Guarani people and threatening many species with extinction.

A Newton-funded project between researchers in the UK and Brazil is helping the Guarani restore the Atlantic Forest in their territory. By drawing from Guarani ancestral agricultural knowledge and established agroforestry techniques, and by promoting a better understanding of the importance of indigenous peoples for environmental conservation, the team are supporting the preservation and restoration of the forest and improving the wellbeing of Guarani communities.

### UK-Chile winner

#### Strengthening energy infrastructure to withstand extreme weather and natural disasters

Long electricity blackouts have a big impact on a country's economic activities, social stability and security. Latin America's energy infrastructure currently lacks the resilience to deal with the increasing frequency of climate-related extreme weather events and natural disasters that cause power supplies to fail.

Newton-funded scientists in the UK and Chile are using mathematical models to develop a framework that will strengthen power systems in Chile and other countries vulnerable to environmental hazards. The framework will help energy providers prevent or reduce widescale electricity outages when power systems are exposed to high-impact, low-probability events. It will inform planning practices to help shape a robust, cost-effective and low-carbon Chilean transmission network. The application of this research will benefit power system planners, regulators and policy makers, contributing to the development of a more resilient, affordable and clean energy supply.



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### **UK-Colombia winner**

## **Turning environmentally damaging coffee waste into electricity**

Waste water from coffee processing is harmful to the environment, as it contains substances that take a very long time to degrade. This is a particular problem in Colombia, the world's third largest coffee producer, where nearly all coffee is grown on small, family-owned farms. The farmers are unable to afford the large-scale water treatment systems needed to process the coffee waste, so it ends up in local water courses, which become contaminated.

Scientists working on a Newton Fund project in Colombia have found that environmentally damaging coffee waste could be turned into electricity using a microbial fuel cell. They discovered that if they fed coffee waste to a community of microbes originally found in a wastewater treatment plant, the tiny creatures would eat it, producing energy. This energy could then be captured in the form of electricity. The research team is now developing a small, inexpensive device suitable for use on Colombian farms.



### **UK-Mexico winner**

## **New drought-resistant beans for sustainable food supply in Mexico**

Beans are central to Mexico's food security, but they are also highly sensitive to drought. Drought can cause up to 80 percent bean yield losses and climate change is making this problem worse. 70 percent of Mexican farmers are smallholders with no irrigation which makes them particularly vulnerable to droughts and climate change.

Researchers in the UK and Mexico are developing climate-ready elite bean varieties to combat drought-related crop losses for Mexican and Latin American agriculture. By understanding how plants respond to drought and carbon dioxide through adjusting their stomata (microscopic valves on the leaf surface that open and close), the researchers are finding that reducing bean stomatal numbers could reduce water use by up to 40 percent without affecting yield; potentially saving up to three percent of Mexico's entire agricultural water use. Using this knowledge, the team want to develop new elite high yielding bean varieties with better water use and nitrogen fixation under drought. With over six million people employed in agriculture and five percent of the population undernourished, developing high yielding, drought-resistant beans will benefit the Mexican economy and future food security, as well as people's health and wellbeing.

## Chair's Prize winner

### Documenting the past for a more peaceful future

Examining the case of Chile and the unprecedented documentation work undertaken by civil society organisations during the Pinochet dictatorship, an international research team has shown how the act of documentation itself is an important mode of resistance to human rights violations. Working closely with human rights advocacy organisations, Newton-funded researchers are increasing the availability of information about human rights violations to inform policy and practice in this important area.

Long term, increased documentation will help societies confront and learn from political violence and protect fundamental human rights – a basic condition for peace, sustainable governance and sustainable human and economic development in any society. Crucially, it will support public policy and measures that help us to move towards a more peaceful future.





The promotion of fair and equitable partnership is fundamental to excellent research and innovation for international development and is built into our theory of change.

## The principles of fair partnership

### Invest in relationships

#### Perspectives from the global south

The Arts and Humanities Research Council, part of UK Research and Innovation, brought GCRF-funded researchers, cultural and development organisations, and diverse partners in low and middle income countries to the UK Parliament in 2019 to discuss how arts and humanities research in international development can make a strong contribution to parliamentary committees and international development policy-making and practice.

### Redressing hierarchies

#### Shifting the dynamics of funding

In the UKRI-GCRF funded South-South Migration, Inequality and Development Hub 2019-24, management is decentralised and the main budgets are held by the 12 country leads in Africa and Asia. The UK-based researchers still coordinate thematic or comparative work packages, but their work in the migration corridors is on an invited basis, as and when needed by the country leads.

### Respect diversity of knowledge and skills

#### Supporting partnerships in call development and delivery

The Biotechnology and Biological Sciences Research Council (BBSRC), part of UK Research and Innovation, held a GCRF workshop in Kenya which brought together 30 experts from nine African countries and 10 from the UK to discuss collaborative research on sustainable agriculture. These discussions informed the scope of future funding calls and BBSRC established an international peer review panel. They developed guidance on panel assessment for those less familiar with UKRI systems and improved guidance for assessors on making judgements about the appropriateness of partnerships. Ongoing evaluation was embedded in the call design for continuous improvement of BBSRC's processes focused on equitable partnerships.

## Forward look...

This report focuses on the financial year 2018–19, but since then we have continued to make significant improvements and developments that have seen the Global Challenges Research Fund and Newton Fund continue to flourish through unique partnerships and collaboration. They include:

- 21 new GCRF Global Engagement Networks to help build community links focused around research challenges.
- The Newton Prize 2019 celebrates UK partnerships with China, Indonesia and Philippines.
- A new Newton Fund Impact Scheme launches to provide previous and current award holders with the opportunity to unlock further impact from their work.
- Our country strategy refresh project will provide common purpose and commitment for research themes across Newton Fund partner countries.
- Transformation project to revolutionise how we monitor and evaluate our funded projects.
- Following a foundation evaluation, the GCRF mainstage evaluation will commence as part of our monitoring and learning activities.
- We team up with Universities UK International (UUKi) to offer prospective applicants to Newton Fund calls with a partner matching service

These initiatives and many more ensure the Newton Fund and GCRF continue to play a central role in meeting the objectives of the SDGs and responding to the major development challenges of our time.

# flourish

## Annex 1: Financial information 2018/19

Table 1. Last two financial year spend by fund

	2017/18 spend	2018/19 spend
GCRF	£206m	£275m
Newton Fund	£102m	£116m
Other ODA*	£140m	£143m
<b>Total</b>	<b>£448m</b>	<b>£534m</b>

\*Core funding of UK Research and Innovation spend that is retrospectively classified as ODA spend after review

Table 2. 2016, 2017 and 2018 calendar year spend by fund

	2016 spend	2017 spend	2018 spend
GCRF	£72m	£180m	£262m
Newton Fund	£92m	£102m	£120m
<b>Total</b>	<b>£164m</b>	<b>£282m</b>	<b>£382m</b>

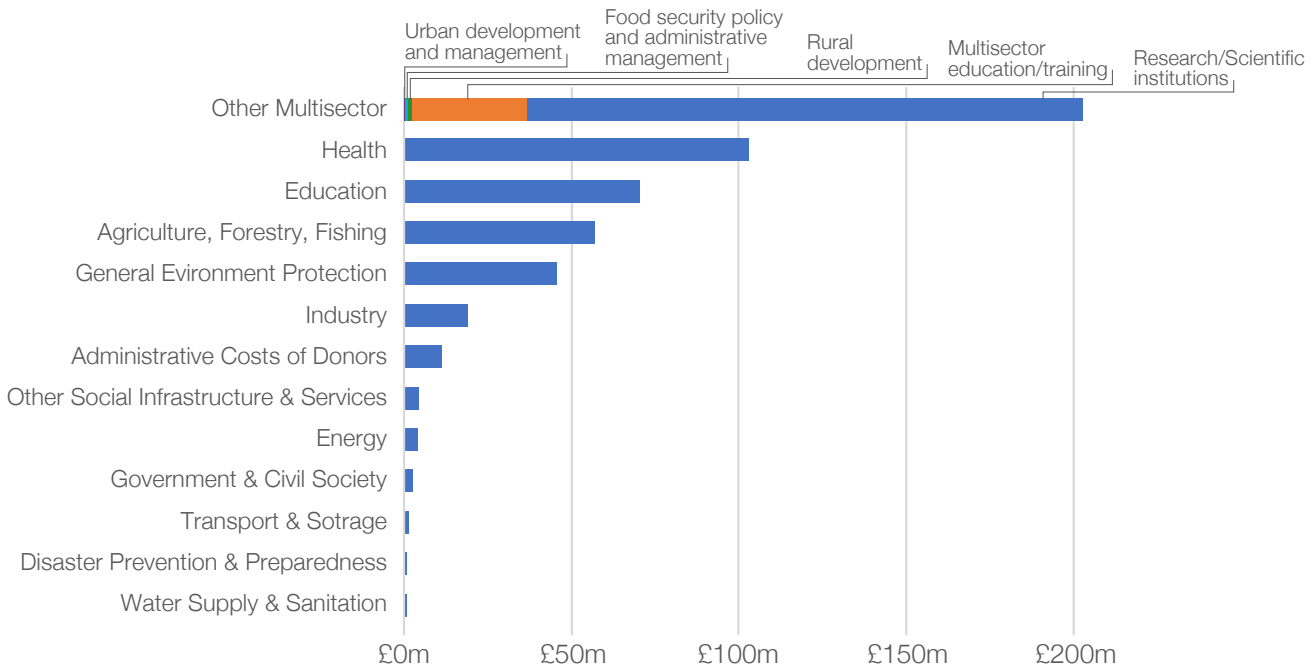


Figure 3. 2018/19 Spend by Sector (£m)

There was also some small spend on Financial Services, Communications and Population Policy that is not included above.

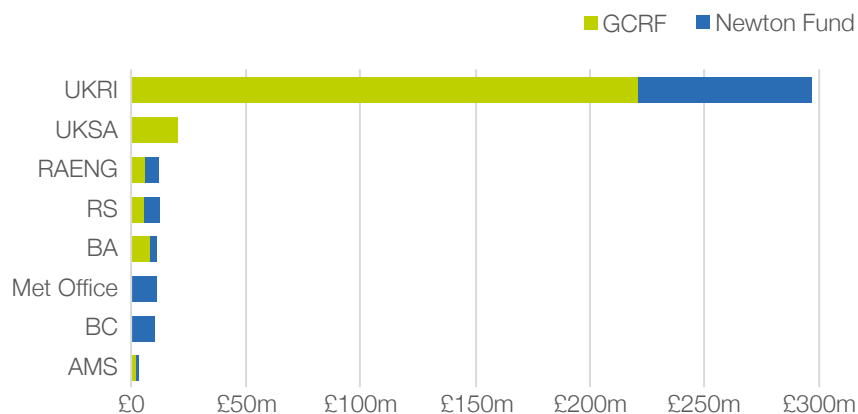


Figure 1. 2018/19 spend by Delivery Partner and fund (£m)

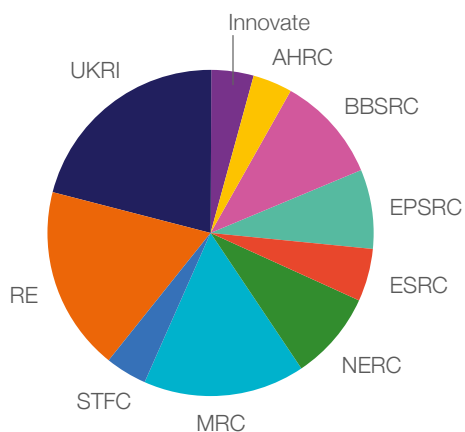
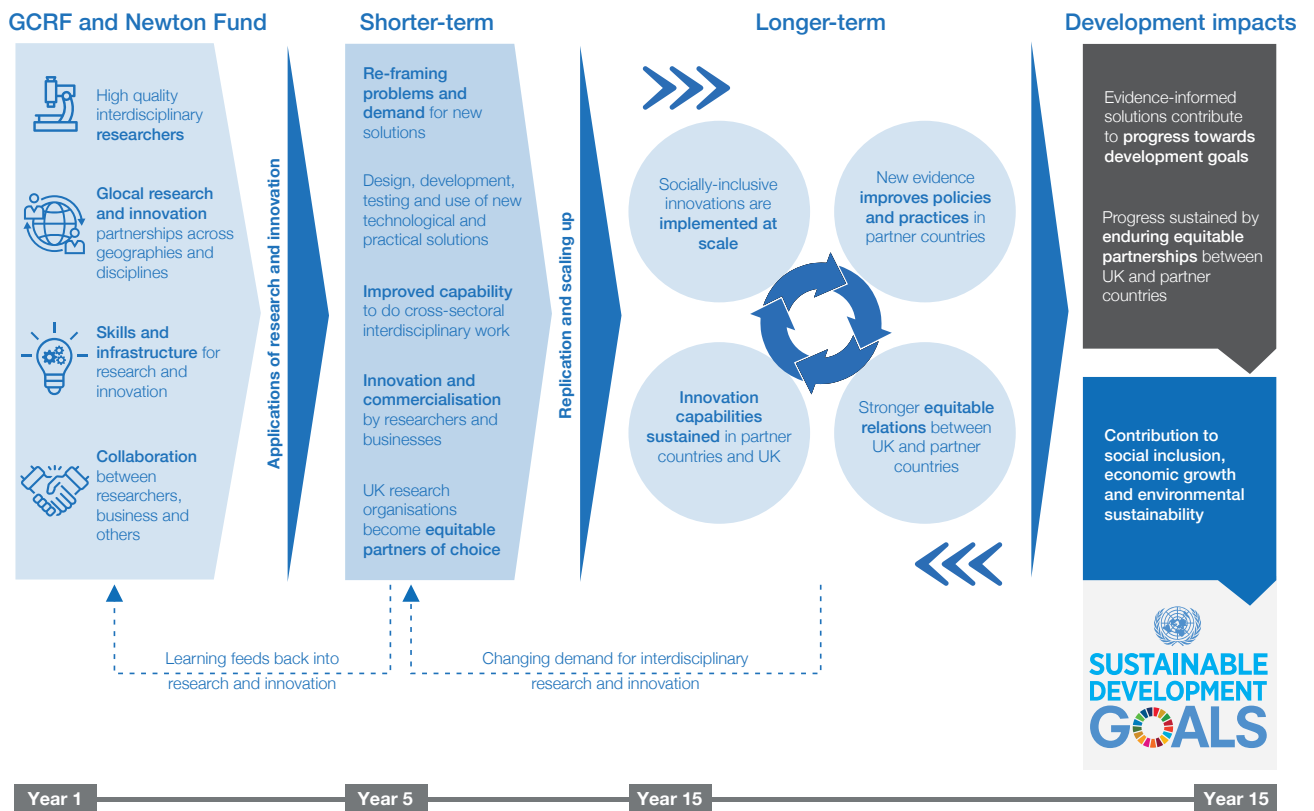


Figure 2. Breakdown of UKRI spend

## Annex 2: How we expect the funds to have impact

BEIS has developed a high-level theory of change which sets out how international research and innovation activities are not only having a short-term impact, but are contributing to long-term sustainable development. Evaluations are conducted to review how programme activities have fed directly into development impacts.

GCRF and the Newton Fund support high quality interdisciplinary research and innovation, equitable research partnerships, enhanced capacities and stakeholder networks. These funds contribute through the better use of research and innovation to the overall goal of poverty reduction through promoting social inclusion, economic growth and environmental sustainability in partner countries.





## Annex 3: Monitoring, evaluation and learning

Monitoring, evaluation and learning are central to the development of both funds and a proportion of our budget has been ring-fenced for this purpose.

### Monitoring

The Delivery Partners and BEIS are continuously monitoring the performance of the funds. To improve the monitoring of the funds, we are developing a set of cross-fund key performance indicators to report on performance. BEIS has started data collection of three. For 2018/19,

These are

**611**

Fellowships

**161**

Instances of Intellectual  
Property protection

**35**

Instances of  
spin-out companies

### Evaluation

We are committed to undertaking independent and robust evaluations and publishing all available data. To date we have delivered six evaluation reports published to Government Social Research Standards on the early life of the funds. The main stage of the Newton Fund evaluation began last year and GCRF will begin this year. Both evaluations will run until at least the end of the funds. Reports on both funds also had suggestions for improvement, so we are making changes in response to these. BEIS and Delivery Partners have strengthened our approach to include a project to fund-level rubric-based assessment, which will be rolled out across both funds this year.

### Learning

Evidence matters, and we want to improve programme performance. We ensure that lessons learnt are built into the dissemination and knowledge transfer in both a real-time and formalised way through: organisational learning, developing external partnerships, staff development and externally commissioned evaluations.

GCRF reports can be found here:

<https://www.gov.uk/government/publications/global-challenges-research-fund-gcrf-foundation-stage-evaluation>

Newton Fund reports can be found here:

<https://www.newtonfund.ac.uk/about/newton-fund-evaluation/>





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