



Department for  
Business, Energy  
& Industrial Strategy

# Newton Fund and Global Challenges Research Fund Annual Report 2017–2018



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Credit: Dreamstime stock image

## Foreword

The International Research and Innovation Strategy, published earlier this year, sets out the importance of global cooperation in finding solutions to major challenges, driving our long-term prosperity and making the most of our world-leading research and innovation ecosystem. UK excellence in research and innovation attracts collaboration from across the world to tackle shared challenges and drive growth.

The Newton Fund and Global Challenges Research Fund couple our research strength with the UK’s recognised leadership in international development to ensure we play a leading role in addressing key development challenges such as human health, food security and climate change. These funds are improving lives and creating opportunities for people in developing countries, as well as contributing to the effectiveness and reach of our research and innovation system at home. It’s a mutually beneficial relationship that focuses on development impact.

The UK thrives on international connectivity, collaboration and partnership, and I want to see these values continuing to flourish. So, I’m proud that our Official Development Assistance funds create and sustain great partnerships between the UK and the rest of the world; from governments and funders, to individuals pursuing shared research interests, to trying to launch a new product or set up a business. I have had the pleasure to meet UK and international partners who have pursued great achievements through these funds. I relish the fact that we are part of a global community, facing challenges together, collaboratively, and drawing upon the best of human intellect and ingenuity.

In recent years my department has become the second largest government spender of Official Development Assistance after the Department for International Development, which is a huge privilege and responsibility. It places important additional requirements on us and we continue to listen, learn and improve. This report is part of our commitment to manage our spend in an open and transparent way. In this report we explain our approach and some of our many successes.

### Chris Skidmore MP

Minister of State for Universities,  
Science, Research and Innovation

“We are part of a global community,  
facing challenges together”

## Newton Fund and Global Challenges Research Fund supporting global goals

Research and innovation has transformed our lives - from the medical advancements that mean we are living longer and have a better quality of life, to the new technologies driving prosperity and sustainable growth. We all benefit from the creation of new knowledge and ideas.

Research and innovation also has a significant role to play in addressing global development challenges, by improving our understanding of issues such as climate change, environmental degradation and sustainable food supply, and applying practical, evidence-based solutions.

Tackling such problems requires international cooperation and the UK has committed to strengthening collaborations with other countries and harnessing its world-leading science, research and development base to deliver the Sustainable Development Goals (SDGs) adopted by United Nations Member States in 2015. The *UK Aid Strategy* draws on skills and expertise from across government to tackle the diversity of challenges the world faces. Collectively, our investments help the world's poorest and most vulnerable, whilst protecting and promoting Britain's national security, economic goals and influence. Since 2015 the UK government has increased its Official Development Assistance (ODA) allocation to research

and innovation as part of this cross-government strategy. At the same time, a greater proportion of the aid budget is now spent through government departments other than the Department for International Development (DfID).

The Department for Business, Energy and Industrial Strategy (BEIS) has two complementary ODA funds, the Newton Fund and Global Challenges Research Fund (GCRF). These share the same primary objective: to promote economic development and welfare of developing countries.

They also share a secondary objective, which is to contribute to the continued strength of the UK's research and innovation base and its wider prosperity, security and global influence.

**“The Newton Fund dramatically increased the research collaboration opportunities for scientists in the UK and their colleagues in Brazil... I do not know of any other country with such a strong research collaboration effort targeting Brazil.”**

**Carlos Henrique de Brito Cruz,**  
Scientific Director, São Paulo Research Foundation, Brazil



Schistosomiasis snail intermediate host.  
Credit: Nick Furnham

The way they achieve these shared objectives is different:

### ■ 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 affecting the partner country and build science and innovation capacity. It is a requirement that UK investment is matched by investment from the partner country.

UK investment

**£735 million**

with 'match' requirement from partner countries

### ■ 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 developing countries, and providing an agile response to emergencies, where there is an urgent research and on-the-ground need.

UK investment

**£1.5 billion**

“

When our researchers talk about the benefits of international partnerships they talk about exchanging knowledge and experience; having access to scientific facilities that may not be available locally; building and maintaining trusted and personal friendships between researchers; and most importantly, how scientific collaboration with and between countries is helping to solve regional and global development challenges.

Professor John Loughhead,  
Chief Scientific Adviser, BEIS

I have been delighted with the progress since the launch of the South Africa – United Kingdom Newton Fund cooperation in 2014. Our partnership has provided a boost to human capital development in both countries, so critical in the age of the knowledge economy.

Mrs GNM Pandor MP,  
then Minister of Science and Technology,  
South Africa

The present India-U.K. cooperation in science and technology is driven by high quality and high impact research partnerships. I am glad to mention that in less than two years' time under the Newton-Bhabha programme we have started wide ranging collaborations covering basic science to solution science aimed at addressing societal challenges.

Indian Prime Minister  
Narendra Modi

I trust the resources provided by the Newton Fund will not only contribute to scientific development but will also assist in instilling pride among our Filipino scientists in their work and encourage more individuals to pursue careers in science and technology.

Then Commission on  
Higher Education Chairperson,  
Patricia Licuanan, Philippines

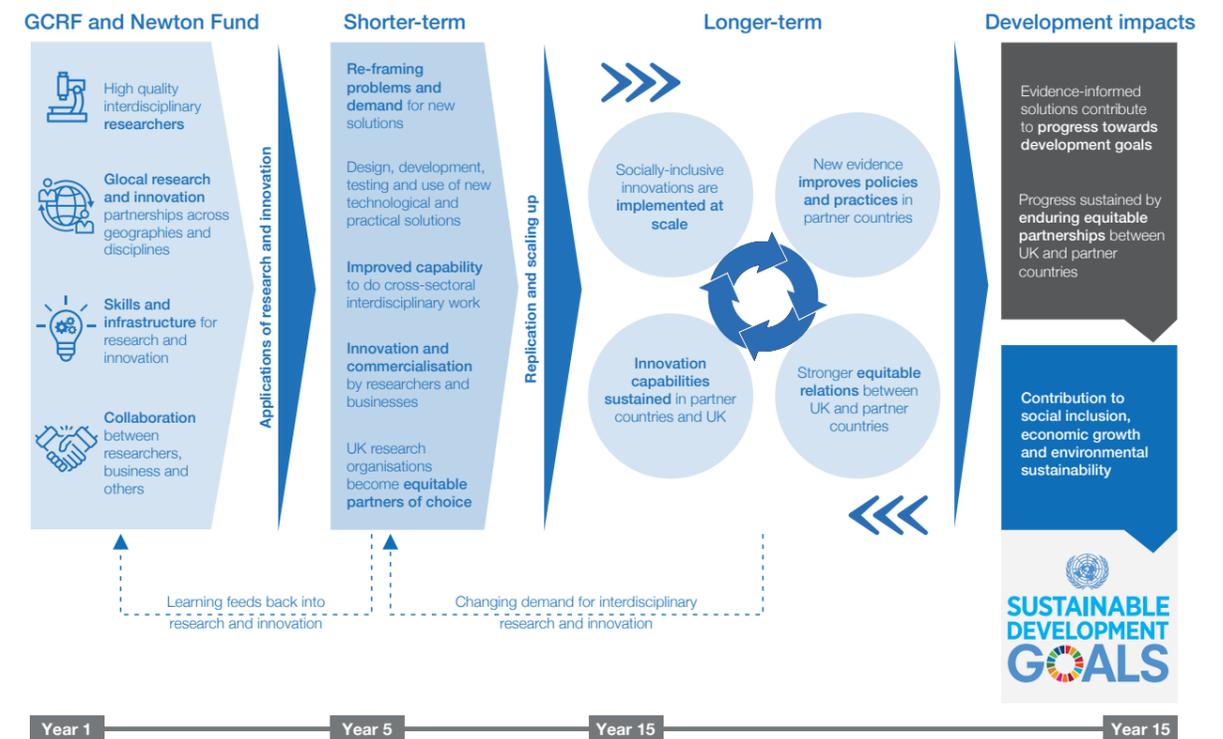
”

growth

## 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.



“ Countries, funders and researchers need to come together at all levels and across all disciplines to share knowledge, skills and resources. This is exactly what funds such as the Newton Fund and the Global Challenges Research Fund are enabling.

With equitable collaborations at their centre, these UK aid investments are supporting researchers from the UK and across low and middle income countries to develop lasting partnerships, build research capacity and strengthen capability that will ultimately improve the lives of millions of people by addressing the Sustainable Development Goals. ”

**Professor Helen Fletcher,**  
UK Research and Innovation’s Director  
of International Development

## SUSTAINABLE DEVELOPMENT GOALS



## Case studies on achieving the SDGs

### Sustainable communities:

The Atlantic Forest is a one of the world’s most biodiverse areas and an essential source of water for more than 70% of people in Brazil, but it is under threat – 90% of it has been destroyed to make way for urban growth and agriculture. A Newton Fund collaboration is helping the Guarani people restore the Atlantic Forest in their territory with agroforestry techniques and promoting a better understanding of the importance of indigenous peoples for environmental conservation.

### Affordable and clean energy:

Industrial emissions, including coal-fired power stations, are a leading cause of air pollution and carbon emissions in India and around the world. SUNRISE is an ambitious GCRF programme to rapidly accelerate and prove low cost printed solar cells, as a viable alternative to fossil fuels, for use in off grid Indian communities.

### Climate action:

Electric vehicles have the potential to revolutionise modern transportation and reduce fossil fuel emissions but current batteries contain graphite – a highly polluting material. A Newton Fund project between the UK and China has developed a more efficient battery which reduces demand for environmentally-damaging graphite and improves battery performance by up to 12 times.

### Peace and justice:

The impacts of the Lebanese Civil War are still being felt today. A GCRF project produced a documentary that brings together ex-fighters from different sides to break the silence and enter a dialogue about the conflict. The film is being used by local NGOs as a peace-building and conflict prevention tool, offering communities a way to express their traumas and share common experiences of suffering.

### Quality education:

Due to poor internet coverage, teachers in remote schools often travel long distances to access educational material. The GCRF iKnowledge project has equipped rural areas in Tanzania with satellite internet to provide teachers with the skills and capability to adopt new technology and improve education.

### Industry, innovation and infrastructure:

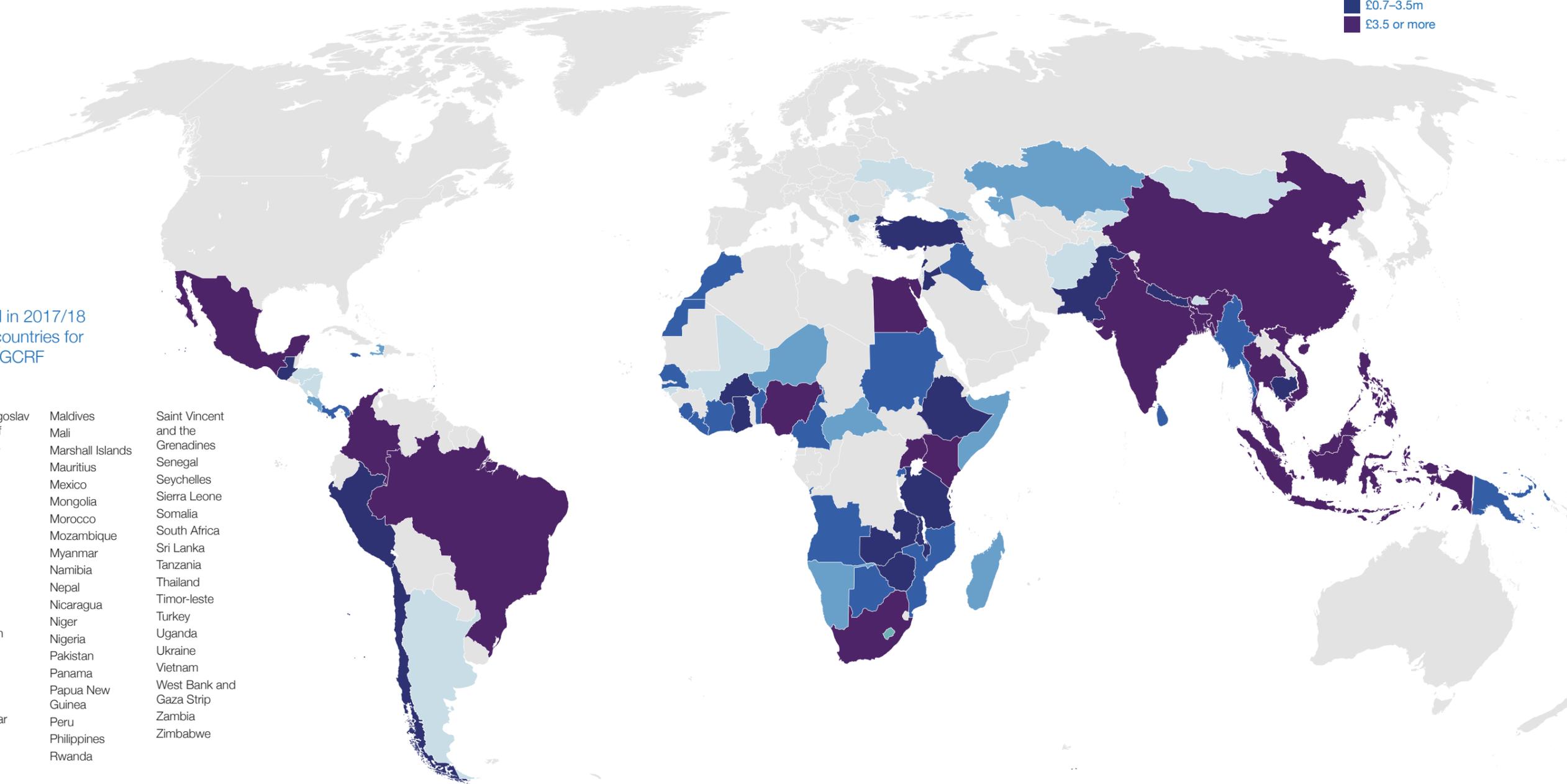
Latin America’s energy infrastructure cannot deal with the increasing frequency of climate-related extreme weather events and natural disasters that cause power supplies to fail. Newton funded scientists in the UK and Chile are using mathematical models to develop a framework that will strengthen power systems in Chile and other countries vulnerable to environmental hazards.

## Research and Innovation ODA spend in benefitting countries 2017/18



A breakdown of spend in 2017/18 across 77 benefitting countries for the Newton Fund and GCRF

- |                              |                                       |                  |                                  |
|------------------------------|---------------------------------------|------------------|----------------------------------|
| Afghanistan                  | Former Yugoslav Republic of Macedonia | Maldives         | Saint Vincent and the Grenadines |
| Angola                       | Gambia                                | Mali             | Senegal                          |
| Bangladesh                   | Georgia                               | Marshall Islands | Seychelles                       |
| Benin                        | Ghana                                 | Mauritius        | Sierra Leone                     |
| Bhutan                       | Guatemala                             | Mexico           | Somalia                          |
| Botswana                     | Haiti                                 | Mongolia         | South Africa                     |
| Brazil                       | Honduras                              | Morocco          | Sri Lanka                        |
| Burkina Faso                 | India                                 | Mozambique       | Tanzania                         |
| Cabo Verde                   | Iraq                                  | Myanmar          | Thailand                         |
| Cambodia                     | Jamaica                               | Namibia          | Timor-leste                      |
| Cameroon                     | Jordan                                | Nepal            | Turkey                           |
| Chile                        | Kazakhstan                            | Nicaragua        | Uganda                           |
| China (People's Republic of) | Kenya                                 | Niger            | Ukraine                          |
| Colombia                     | Lebanon                               | Nigeria          | Vietnam                          |
| Costa Rica                   | Lesotho                               | Pakistan         | West Bank and Gaza Strip         |
| Côte d'Ivoire                | Liberia                               | Panama           | Zambia                           |
| Dominica                     | Madagascar                            | Papua New Guinea | Zimbabwe                         |
| Egypt                        | Malawi                                | Peru             |                                  |
| Ethiopia                     | Malaysia                              | Philippines      |                                  |
| Fiji                         |                                       | Rwanda           |                                  |



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.

## Newton Fund

### Research and innovation partnerships for sustainable equitable growth

The Newton Fund is administered by BEIS who allocate spend to a range of delivery partners including: UK Research and Innovation (UKRI), National Academies and the British Council. UK delivery partners work with their counterparts in the Newton ‘partner country’ to issue calls for research proposals to which UK universities apply through a competitive process.

Launched in 2014, the fund supports 17 UK 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.



Seed exchange. Credit: Carolina Comandulli, UCL

All Newton Fund partner countries are eligible to receive ODA. A distinctive feature of the Newton Fund is the requirement for matched effort from each of the partner countries, which usually equates to matched funding when differences in purchasing power and benefits-in-kind are considered. 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 lower and upper middle income countries rather than low income and least developed. Other ODA funds, including GCRF, complement this approach and work with the least developed countries.

The UK and Newton partner countries co-develop a strategy focused on their development needs, setting out what challenges the Newton Fund partnership will address and how. Therefore each partnership is unique, but includes a mix of joint research and innovation programmes and capacity building programmes. Several Newton Fund countries have co-branded their Newton Fund partnerships, naming them after national scientists. This illustrates the joint design and delivery model, and therefore co-ownership of the Fund. This includes the Newton-Bhabha Fund in India and the Newton-Caldas Fund in Colombia, named after Francisco José de Caldas, considered the father of engineering in Colombia and the inventor of the hypsometer.

**“The Newton-Paulet Fund is very important because it has been designed based on the principle of mutual cooperation; both Peruvian and British knowledge and resources are valued.”**

**Fabiola Leon-Velarde,**  
President of Peru’s National Council of Science and Innovation

## Areas of work

### People

improving research and innovation expertise (capacity building), student and researcher fellowships, mobility schemes and joint research centres.

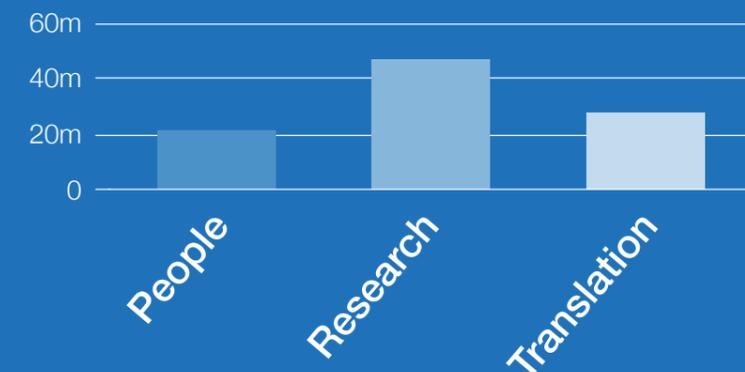
### Research

research collaborations on development topics.

### Translation

innovation partnerships and challenge funds to develop innovative solutions on development topics.

Figure 1: 2017/18 Newton Fund spend by pillar (£m)\*



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

## Early evaluation findings

Since 2015, BEIS has been working with external evaluators, Coffey International, to evaluate the Newton Fund. In the 2017/18 mid term evaluation, Coffey found that the Newton Fund is delivering results consistent with its goals and reaching target recipients.

### Key Findings from the mid-term review include:

# 1

The Newton Fund has established an appropriate and relevant mix of countries with whom the UK can meaningfully seek to enhance cooperation in the field of science, research and innovation. They demonstrate different levels of science and innovation capacity and a willingness to engage with the UK on research and innovation partnerships.

# 2

Newton Fund activities are reaching the intended recipients, predominantly academics and PhD students and researchers, with smaller numbers of private and public-sector recipients.

# 3

Activities fit well within the results framework established in the Newton Fund’s theory of change and are closely aligned with partner country priorities for science and innovation - highlighting the importance of mutual interest as one of the success factors in delivering positive collaborations at both government-government level and between academics and researchers.

# 4

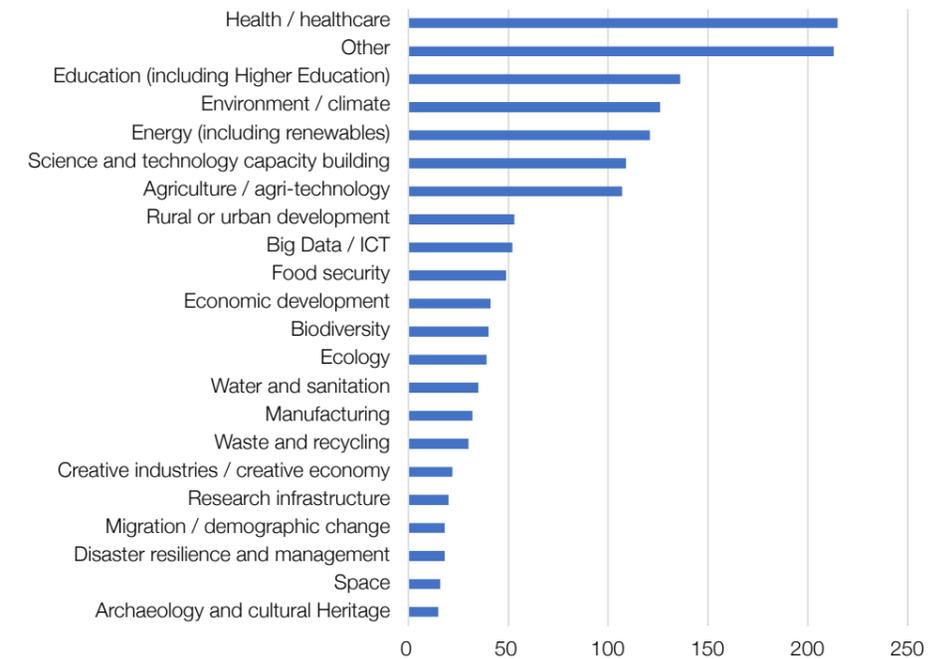
Almost 40% of known Newton Fund participants to date are female – albeit with significant variation across partner countries – and there are examples of Newton Fund projects that are targeting women or gender equality issues in science and innovation.

# 5

The Newton Fund has improved the capacity of individuals and institutions to deliver high quality science.

The Newton Fund supports research and innovation on a broad range of topics with the largest number of awards related to health.

Figure 2: Newton Fund research topics of award holders



Taken from an online survey of 862 award holders from the mid-term evaluation. Respondents could choose multiple categories.

“Newton has supported 71 scientists to undertake doctoral courses and research exchange activities as well as another 60 scientists to participate in the training on technology commercialisation. Through the Newton Programme Vietnam, I believe that the two countries will continue to promote research projects and scientist exchanges in fields of mutual interest.”

**His Excellency Chu Ngoc Anh,**  
Minister of Science and Technology, Vietnam

## Newton Prize 2017

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 2017 the prize was awarded to projects in India, Malaysia, Thailand and Vietnam and covered topics including: sustainable energy production, safeguarding the vital shrimp industry, and DNA sequencing technology that could improve the rate of diagnoses and successful treatment of rare genetic diseases.

### Vietnam winner: Communicating in a disaster

In the past two decades natural disasters have claimed more than 13,000 lives and caused £5.2 billion of damage in Vietnam. The impact is worse for those in remote and isolated areas with no access to information and communication technologies (ICT) facilities, which provide vital warnings and aid rescue missions.

A Newton UK-Vietnam research team has come up with a wireless communications system which can withstand natural disasters such as an earthquake or hurricane. It can cope with physical destruction of telecommunication networks, lack of power supply and network congestion. The system also provides early warning of natural disasters by detecting water level, vibration and wind, or increases in dust, temperature, and carbon dioxide levels in cities.

The team behind this system has trained more than 160 lecturers/PhD and MSc students from 20 universities, private and public sector in Vietnam.



### India winner: A new device for routine maternity care

Obstetric haemorrhage, pre-eclampsia and sepsis account for more than 50% of maternal deaths worldwide (UNICEF, 2017). Early detection and effective management of these conditions relies on vital signs monitoring, including pulse and blood pressure. A collaboration between King's College London in the UK and India's Jawaharlal Nehru Medical College developed a novel device called the CRADLE Vital Sign Alert, which can detect abnormal vital signs and the risk of deterioration due to common pregnancy complications. It can be used and understood by anyone thanks to its inbuilt traffic light alert.

The strong collaboration between UK and Indian researchers via the Newton-Bhabha fund delivered more than 3,300 devices to hospitals and clinics in developing countries and more than 1,500 healthcare workers have been trained to use the device. Implementation continues in Sierra Leone, Ethiopia, Haiti and India.

In November 2017 this project was awarded the Newton Prize, which will enable the team to introduce 880 CRADLE Vital Sign Alert devices to all health centres and volunteer health team workers in Bidibidi and Nakivale refugee settlements in Uganda.



Credit: Katy Kurht, CRADLE project

For more information or to find out more about our winners, visit [www.newtonfund.ac.uk/newtonprize](http://www.newtonfund.ac.uk/newtonprize)



## Global Challenges Research Fund

### Challenge-led research for sustainable development

GCRF mobilises the UK research and innovation system towards global development challenges through collaboration with researchers in developing countries.

Funding supports universities, industry and research organisations to deliver collaborative research and innovation, conduct interdisciplinary, challenge-led research and enable quick responses to emergencies where urgent research is needed.

Launched in 2016, the fund is administered by BEIS who allocate funding to a range of delivery partners including UKRI, the National Academies, the UK Space Agency

and the UK Higher Education Funding Councils for England, Scotland, Wales and Northern Ireland. Delivery partners distribute funds to a range of research institutions based on a competitive process.

GCRF fund allows UK research excellence to be deployed in a strategic way to generate solutions to the most significant and complex problems faced by developing countries while at the same time strengthening their research capability.

**“The GCRF is a novel and exciting initiative that brings the strengths of different disciplines and approaches to bear in tackling complex development issues.”**

**Professor Sir Mike Aaronson,**  
Chair of the GCRF Strategic Advisory Group

## Areas of work

GCRF funding is intended to create complementary programmes that:

### Promote challenge-led disciplinary and interdisciplinary research

including the participation of researchers who are new to international development and bring fresh approaches & innovation.

### Strengthen capacity

for research, innovation and knowledge exchange in the UK and developing countries through partnership with excellent UK research and researchers.

### Provide an agile response to emergencies

where there is an urgent research need.



Elderly man overlooks port, Yangtze river.  
Credit: Gail Wilson, University of Glasgow



The **12 challenge areas** below provide a framework through which the GCRF targets work to achieve lasting change.

### Equitable access to sustainable development:

Our vision is to create new knowledge and drive innovation that helps to ensure everyone across the globe has access to:

-  secure and resilient food systems supported by sustainable marine resources and agriculture
-  sustainable health and well being
-  inclusive and equitable quality education
-  clean air, water and sanitation
-  affordable, reliable, sustainable energy.

### Sustainable economies and societies:

The pace, nature and patterns of economic growth are threatening the future of our climate and ecosystems and are placing a major burden on the Earth's resources. GCRF encourages research and innovation that in the longer-term, builds:

-  sustainable livelihoods supported by strong foundations for inclusive economic growth and innovation
-  resilience and action on short-term environmental shocks and long-term environmental change
-  sustainable cities and communities
-  sustainable production and consumption of materials and other resources.

### Human rights, good governance and social justice:

It is increasingly recognised that development, human rights, good governance and social justice are indivisible. The GCRF supports research and innovation that enables us to:

-  understand and respond effectively to forced displacement and multiple refugee crises
-  reduce conflict and promote peace, justice and humanitarian action
-  reduce poverty and inequality, including gender inequalities.

## GCRF case studies

### Sustainable cities and communities:

The impacts of drought on young people are particularly severe in sub-Saharan Africa where recurrent drought intersects with development challenges such as inequality, exclusion, poor education and a lack of employability skills. A study is examining how social and environmental systems effect the resilience of young people living in drought-challenged Govan Mbeki in South Africa. The project is co-produced with the young people themselves.

### Secure, reliable and sustainable energy:

Electricity theft has a massive cost to society, causing financial losses and disrupting access to power for homes and businesses. Designed and developed by Kamata Online Protection Services Limited, Kamata is a prevention system that alerts regional utility centres when power is being tampered with or manipulated allowing the utility centre to remotely restore power after the incident is resolved. The innovation made the final shortlist for the Royal Academy of Engineering Africa Prize.

### Sustainable livelihoods:

To improve the livelihoods of smallholder and larger scale farmers and reduce crop losses caused by pests, the PRISE project brings together different stakeholders in Ghana, Kenya and Zambia, including plant protection authorities, data experts, private sector companies, and the farmers themselves, and uses state-of-the-art crop and pest modelling techniques to provide users with advanced warning of a damaging outbreak and appropriate advice on mitigation responses.

### Reducing gender inequalities:

Intimate partner violence is a human rights, development and public health issue, with one in three women worldwide reporting physical and/or sexual violence by their partners (WHO, 2017). The prevalence of intimate partner violence is particularly high in Southern and Eastern Africa, where up to 46% of women report to have experienced such violence during their lifetime. In Tanzania and South Africa, researchers are investigating how economic empowerment affects intimate partner violence and whether it can be a tool to reduce rates of violence against women. The study is providing vital evidence to improve understanding of this complex issue and support policymakers.

## Impact in focus: Mobile phone-connected diagnostics for HIV

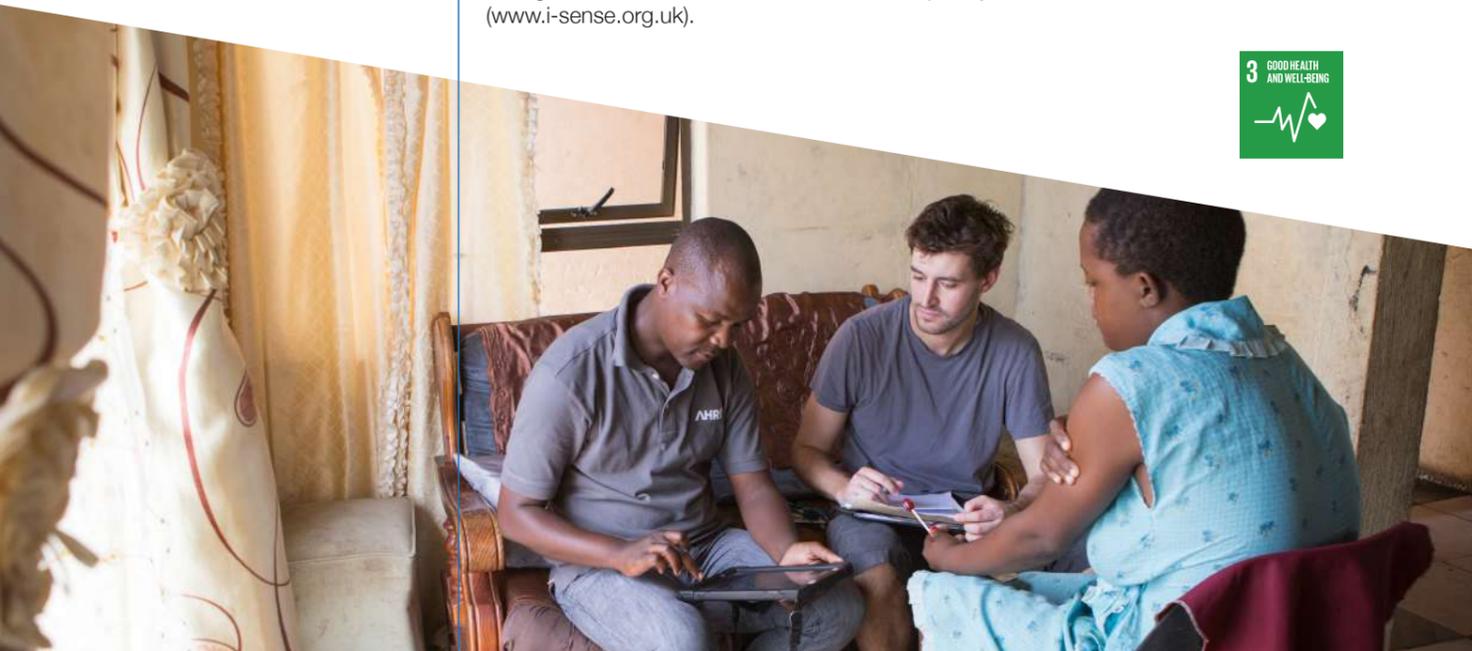
South Africa is the global epicentre of the HIV epidemic; almost seven million people are living with HIV and almost 300,000 people acquire HIV each year (Avert, 2017). A Global Challenges Research Fund (GCRF) project called m-Africa is transforming access to HIV testing and treatment by building a new generation of mobile phone-connected diagnostic tests and online care pathways.

HIV testing and treatment can prolong lives and reduce HIV transmission, but getting young people and men to test and link into HIV care is a huge challenge. The mobile phone-connected test and app being developed through m-Africa will detect infections and then wirelessly connect test results to healthcare systems, minimising the need for clinic visits.

The project has built a library of more than 40,000 unique images of HIV point-of-care tests to train a machine learning model that will automatically read the test results from a photo taken on a mobile device. Researchers have trained 60 field workers at the Africa Health Research Institute to help build the library. The system also incorporates novel, ultra-sensitive nanomaterials to detect the early stages of HIV.

In parallel, a prototype smartphone app is being piloted to investigate participant feelings about self-testing using an app, as well as participant reactions to being told their test results by a device, and the phone counselling and support that follows.

This research was awarded by UK Research and Innovation (UKRI) through the Medical Research Council (MRC) and is part of the EDCTP2 programme supported by the European Union. m-Africa is led by Professor Rachel McKendry at UCL and Professor Deenan Pillay at Africa Health Research Institute and UCL, in collaboration with Imperial College London and i-sense EPSRC Interdisciplinary Research Collaborations ([www.i-sense.org.uk](http://www.i-sense.org.uk)).



Fieldwork. Credit: M-Africa and i-sense

## GCRF Challenge Leaders

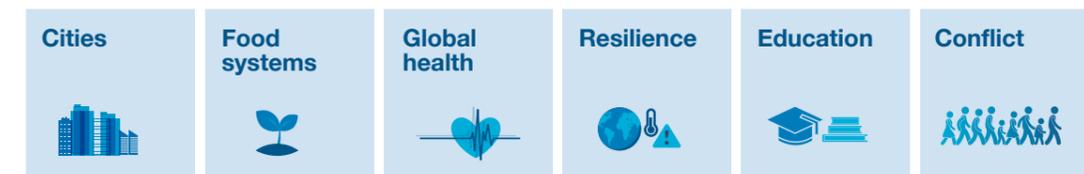
To strengthen the strategic delivery of programme objectives, GCRF has developed the role of Challenge Leaders to ensure that GCRF can have the greatest possible impact on global development. They provide intellectual and strategic leadership for GCRF challenge areas, ensuring coherence and impact.

The Challenge Leaders work closely with GCRF investments to ensure a close match between new insights emerging from GCRF researchers and the strategic needs and ambitions of development partners as framed by the Sustainable Development Goals.

They have provided guidance on a series of interdisciplinary calls across the delivery partners designed to enhance the overall impact across the six strategic GCRF Challenge portfolios.

The Challenge Leaders, who are specialists in their area, are enhancing the impact of the GCRF portfolio by building strategic partnerships with key people and organisations working in international development. In 2018 Challenge Leaders Neelam Raina, Tahrat Shahid, John Rees and Mark Pelling ran two joint workshops with the UN Development Programme on ‘Conflict, Climate Change and Disruptions in Food and Water Systems’ and ‘Pathways for Peace’. The interdisciplinary workshops brought GCRF-funded academic leaders together with United Nations and World Bank policy experts to build resilience by identifying and assessing challenges and coming up with solutions to create effective policy responses.

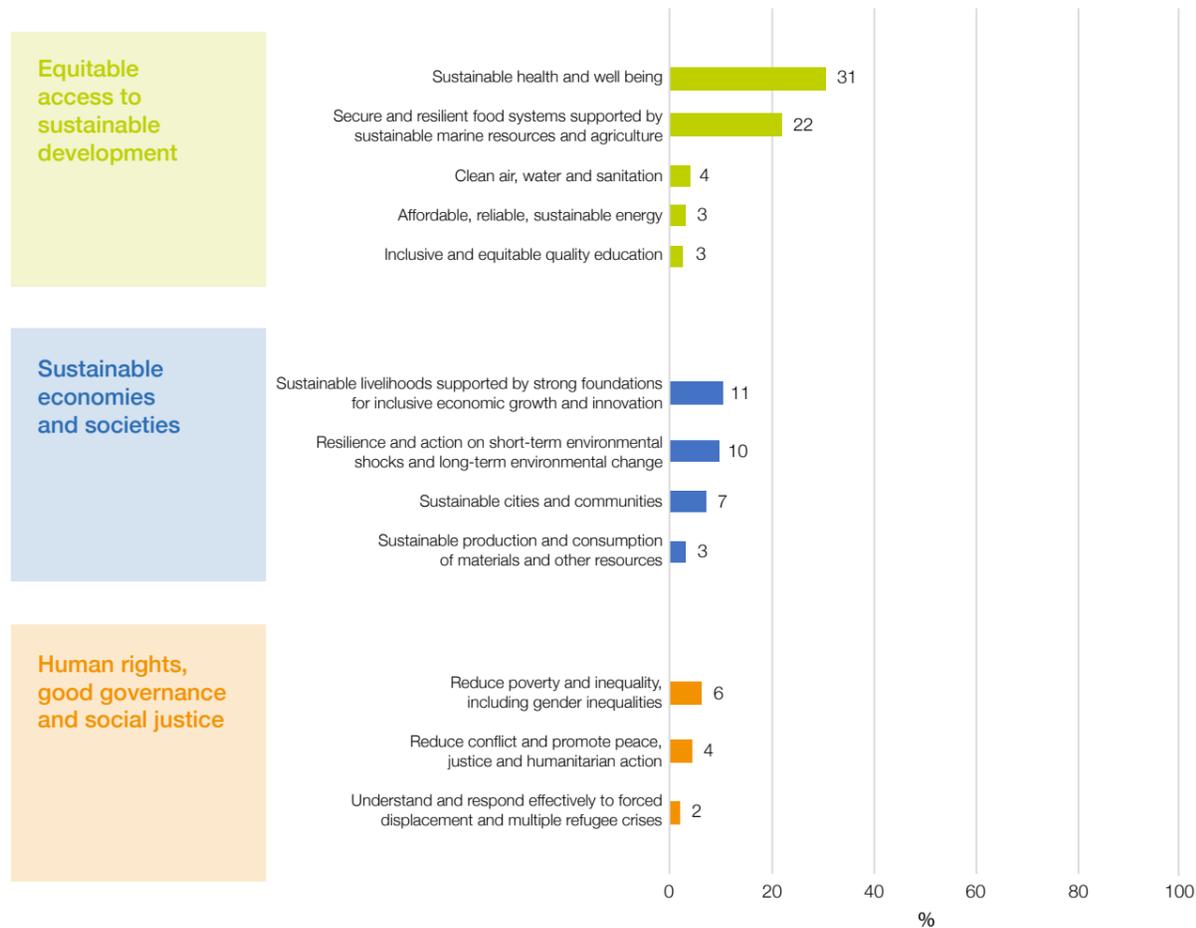
Figure 3: Challenge Leader portfolios



“The appointment of these Challenge Leaders will ensure that the GCRF can connect with those on the frontline of global development and respond to the needs and ambitions of developing countries.”

**Professor Andrew Thompson,**  
UKRI Executive Champion for the GCRF and Newton Fund

Figure 4: Percentage of awards addressing GCRF challenge areas



Based on first n=1,410 awards. Awards can cover multiple challenge areas. Taken from the GCRF process evaluation.

## Spotlight: Building Capacity for a sustainable future

For this first annual report, we present a spotlight on the extensive work on capacity building through GCRF and the Newton Fund, which is recognised as an essential building block of development work.

### There are three levels of research capacity building:

#### Individual

involving the development of researchers and teams via training and scholarships, to design and undertake research, write up and publish research findings, influence policy makers, etc.

#### Organisational

developing the capacity of research departments in universities, think tanks and so on, to fund, manage and sustain themselves.

#### Institutional

changing, over time, the 'rules of the game' and addressing the incentive structures, the political and the regulatory context and the resource base in which research is undertaken and used by policy makers.

The Academies' Newton International and Advanced Fellowships and GCRF Networking Grants establish collaborations between UK and overseas researchers (and their research groups), and provide training and opportunities for skill transfers, so that a cohort of outstanding researchers can be nurtured. As they move into leadership positions, the researchers contribute to the development of a strong research community and a robust research and innovation infrastructure, which is an important driver of socio-economic development.

At an organisational level, the Royal Academy of Engineering's GCRF Africa Catalyst programme and the Newton

Fund Industry-Academia partnership programme build the capabilities of international universities and professional engineering bodies in developing countries, strengthening engineering and innovation ecosystems and enabling countries to drive their own development.

Newton Fund and GCRF collaborations between UK delivery partners and their counterparts in developing countries strengthen research and innovation systems and research management capacity. Following a RCUK-TÜBİTAK joint Newton call, Turkish delivery partner TÜBİTAK improved their application and peer review system for joint calls, allowing greater flexibility

for collaboration between international partners. In Malaysia, the Newton Fund has facilitated a STEM Excellence Centre modelled on the UK's STEM Learning Centre. These partnerships help to create the conditions where research and innovation can thrive.

Independent reviewers, Coffey International, found strong evidence that Newton Fund activities have successfully built the capacity of individuals and institutions in partner countries and the UK. The ability of the Newton Fund to foster and support long-term collaboration was found to be a strength of our model.

## Case studies on capacity development

### Sustainable policymaking:

The Innovate UK and Nesta Global Innovation Policy Accelerator is a ground-breaking collaborative capability development programme for senior innovation policymakers. So far, the accelerator has worked with 17 teams of innovation policy directors drawn from 70 agencies and ministries from 11 developing countries, reaching over 1,000 people on three continents, and connecting to officials from over 40 UK innovation policy institutions and organisations.

### Supporting innovation:

Innovators need support to develop sustainable solutions to development challenges. The Royal Academy of Engineering Leaders in Innovation Fellow programme helps researchers to commercialise an innovation, such as the 'MaziwaPlus Pre-Chiller' - a portable solar powered cooling system that improves the lot of milk producers and dairy cooperatives in Kenya by keeping milk fresh from farm to cooperative. Over 300 farmers signed up over two months.

### Strengthening research capability:

Biodiversity affects every aspect of our lives, however a growing body of evidence shows that it is decreasing at an alarming rate. The GCRF Grow Colombia programme aims to strengthen Colombian research capability in the biological sciences, computational biology, and socio-economics to develop robust coordinated activities under a shared vision centred on biodiversity as a means to achieve sustainability and peace.

### Climate resilience:

High impact weather such as monsoons, tropical cyclones and cold surges, all have the potential to incur loss of life, injury and economic costs. The Met Office has led and developed a global network of science partnerships to strengthen the resilience of vulnerable communities to weather and climate variability and provided training to forecasters in-country on the prediction and communication of high-impact weather.

### Empowerment through crafts:

An Arts and Humanities Research Council project has analysed the role of culture and material practices in the lives of women who witness protracted conflict and ongoing violence. Women living in communities at the conflict-affected contested border between India and Pakistan are being supported through training and peer to peer learning – to develop craft practices to generate sustainable incomes. Building capacity with local NGOs has also widened the project's reach and ensured the project's sustainability.

## Impact in focus: The race to find new drugs for a neglected tropical disease

Schistosomiasis is a neglected yet important disease which affects the poorest and most vulnerable people in the world. Those infected with the disease can experience liver damage, kidney failure, infertility, or bladder cancer. The disease is spread through contact with fresh water contaminated with parasite flatworms.

The disease is especially common among children in developing countries as they are more likely to play in contaminated water. There is one drug available to treat the disease and yet even this lifeline is in doubt as the parasite is developing resistance to it. The race is on to create new drugs to fight the disease.

Newton funded researchers in the UK and Brazil are using advanced x-ray technology at the UK's national synchrotron science facility. They hope to find a way to prevent a protein prevalent in schistosoma worms – and known to be crucial to its survival – from working, starting the process of drug discovery. The team established a new interdisciplinary network bringing together multiple groups in the UK and Brazil to work towards a common goal. It has allowed for a two-way transfer of technology and knowledge exchange that has helped to both build capacity in an endemic country as well as advance the development of methods in their application to real world problems.

The team hopes to strengthen collaborations with the Brazilian Ministry of Health to enable clinical trials of candidate drugs against schistosomiasis and to create unprecedented capacity in Brazil for state-of-the-art drug discovery, which could be applied to other neglected diseases.

The project was led by Nicholas Furnham, London School of Hygiene and Tropical Medicine and Floriano Silva-Jr, Oswaldo Cruz Foundation, and was funded by UKRI through the Medical Research Council. In 2018 it was shortlisted for the 2018 Newton Prize, and the team have since won a Newton Advanced Fellowship with the Academy of Medical Sciences to continue strengthening research capability in this field.



## Supporting wider UK Government Objectives

As well as promoting the economic development and welfare of developing countries, the Newton Fund and GCRF produce a wealth of benefits supporting the work of government in the UK and internationally, including national security and foreign policy objectives.

The Newton Fund and GCRF support the HMG International Research and Innovation Strategy themes, which embody the UK's offer to international audiences, other governments, research organisations, businesses and investors, and individual researchers and entrepreneurs:

- **A global partner:** we create and promote partnerships between governments, universities and researchers, guided by development impact and research excellence.
- **Bringing together talent:** we connect researchers and entrepreneurs, support their professional development and the translation of their ideas into businesses and products, and build global research networks.
- **A global hub for innovation:** we support research and innovation hubs between the UK and partner organisations around the world for researchers and innovators to connect and tackle global development challenges.
- **A global platform for the technologies of tomorrow:** we form and strengthen industry-academia partnerships that bring forward emerging technologies and the business know-how to help them flourish.
- **A partner for a sustainable future:** we build and invest in collaborative partnerships to tackle the greatest global challenges.
- **An advocate for better research governance, ethics and impact:** we contribute to research and innovation infrastructure and capacity around the world based on research excellence in the UK.

The UK's research and innovation systems are world leading. Our ODA funds internationalise this expertise for development, giving the UK a stronger and more positive voice in the world, which is even more crucial as we exit the European Union.

## 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. We are committed to undertaking independent and robust evaluations and publishing all available data. We are developing cross-fund key performance indicators to report on performance and will start data collection in the autumn with the intention to publish early findings in the next annual report.

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 GCRF and Newton Fund evaluations will begin this year, and will run until at least the end of the funds.

Reports on both funds also had suggestions for improvement, so we are making changes to address these. One key area is the delivery of the Transformation Project to enable more efficient portfolio management, better financial reporting and transparency, and improved recording of process and responsibilities.

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/>

## Forward look...

This report focuses on the year 2017–18, but since then we have continued to make significant improvements and developments that have seen the Newton Fund and GCRF continue to flourish through unique partnerships and collaboration. They include:

- 12 UKRI GCRF Global Interdisciplinary Research Hubs focusing on intractable development challenges which have proved difficult to solve by one organisation, country or discipline.
- FLAIR Fellowships give talented African early career researchers who have the potential to become leaders in their field the opportunity to build an independent research career in a sub-Saharan African institution.
- A landmark sustainable rice initiative between the UK, China, the Philippines, Thailand and Vietnam.
- The Met Office expanded its Weather and Climate Service for Services Programme to more countries.
- The Newton Prize 2018 celebrated UK-Latin American research partnerships.
- We welcomed scrutiny of our funds and have taken part in reviews undertaken by the Independent Commission for Aid Impact.
- We shared government commitments and actions to demonstrate organisations involved in UK-funded international development research are strengthening their systems and policies to support safeguarding efforts.
- A transformation project is underway to revolutionise how we monitor and evaluate our funded projects.
- We have made progress on our commitment to achieve a 'good' to 'very good' level of transparency in the International Aid Transparency Index (IATI) by 2020 and are working with our delivery partners to publish as much data as possible.
- Our country strategy refresh project will provide common purpose and objectives between the UK and Newton Fund country partners on future research themes.

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



## Annex 1: Financial information 2017–18

Table 1. 2017/18 spend by fund

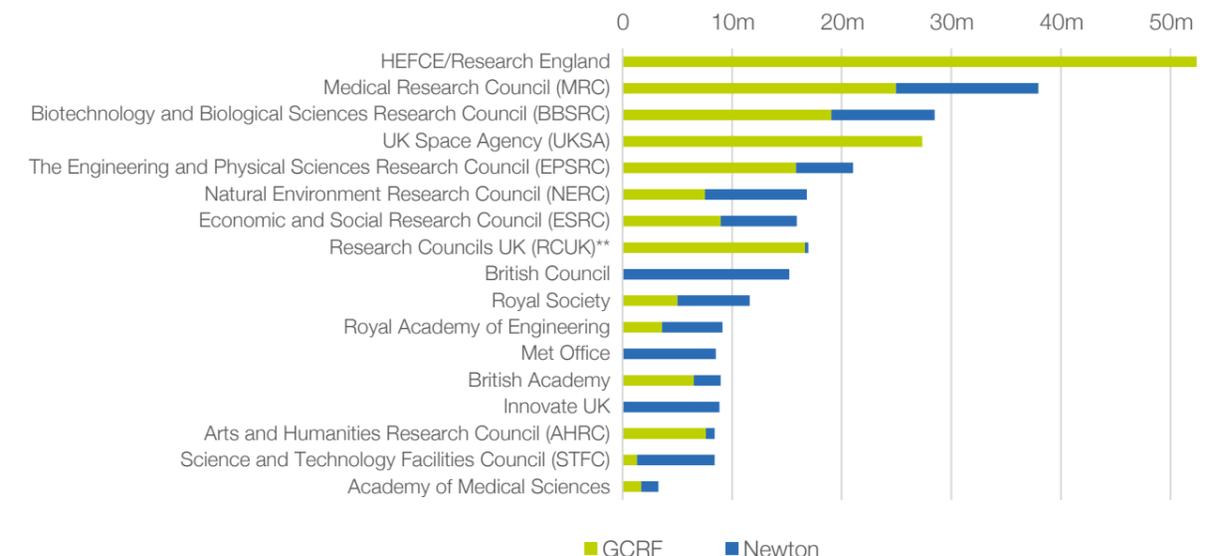
	2017/18 spend
Newton Fund	£102m
GCRF	£206m
Other ODA <sup>2</sup>	£140m
<b>Total</b>	<b>£448m</b>

UK Research and Innovation spend from core science budgets that are retrospectively classified as ODA spend after review

Table 2. 2016 and 2017 calendar year spend by fund

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

Figure 5: 2017/18 spend by delivery partner and fund (£m)\*



<sup>2</sup>This core funding of UK Research and Innovation spend that are retrospectively classified as ODA spend after review.

\*Excludes all cross cutting multi-sector spend, funds allocated to 'Delivery' and 'Monitoring', and funds not associated with an individual delivery partner. This represents UK investment only. \*\* RCUK became UKRI from April 2018.



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