Department for Business, Energy & Industrial Strategy

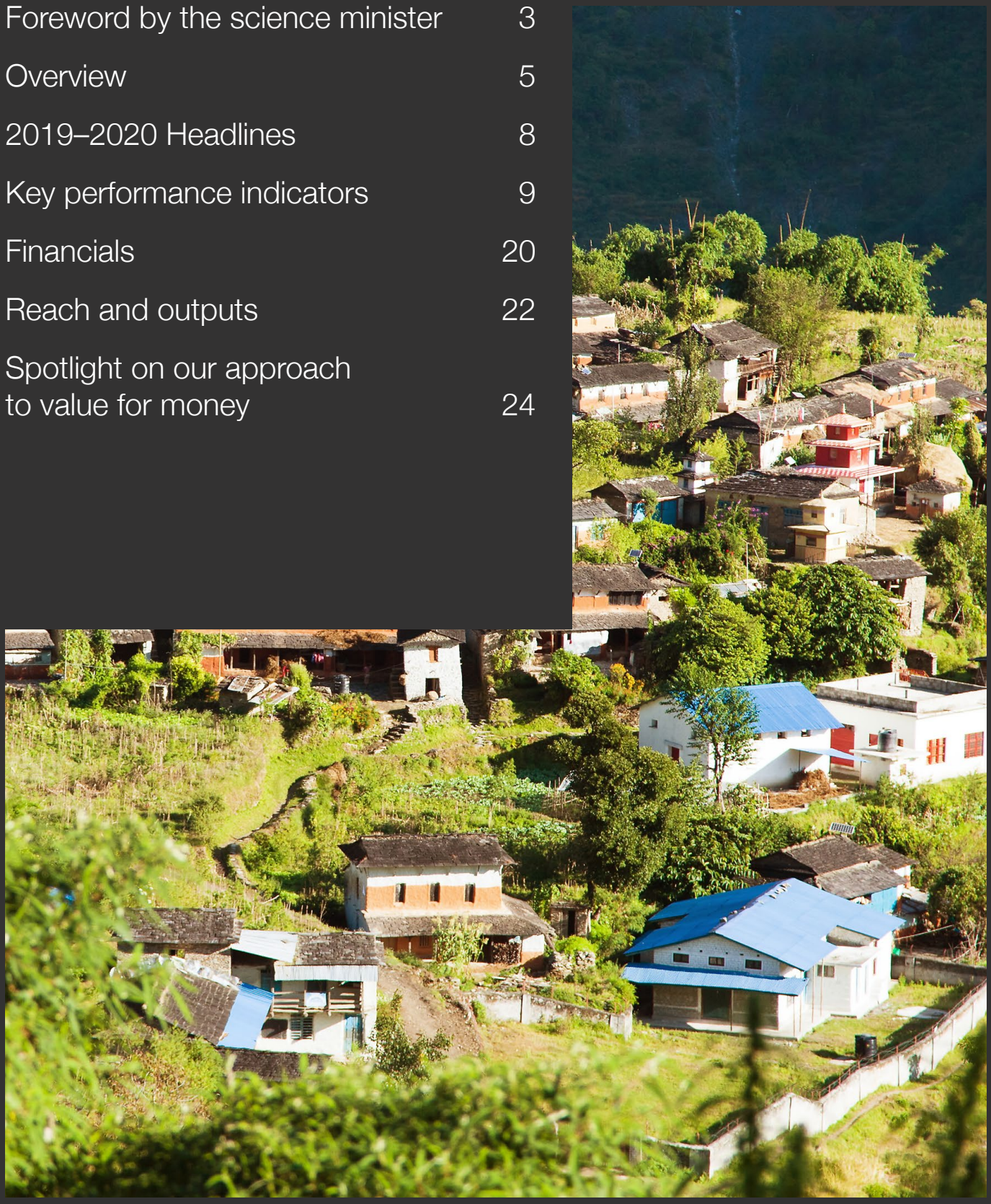
Research and Innovation for Development at BEIS

Annual Review 2019–2020

GCRF

Newton Fund

Contents



Village in western Nepal, Dhaulagiri area, Western Nepal – Getty Images

Foreword by George Freeman

Investing our Official Development Assistance (ODA) in research and development 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.

Over the last seven years this work has helped us to understand key challenges. For example, we have invested half a billion pounds in over 500 projects and partnerships on climate change, providing vital knowledge and intelligence for policy makers to make more informed decisions.

2019–2020 was another incredible year.

- The UK Space Agency's International Partnership Programme won a 2019 Better Satellite Award from Space & Satellite Professionals International (SSPI), which honours innovative organisations helping make the world a more prosperous, healthier, better-educated, sustainable and inclusive home for humankind.
- The COVID-19 pandemic placed families under extreme stress. Open-source parenting resources developed by a GCRF funded team reached over 86 million families in 180 countries worldwide.
- The Royal Academy of Engineering celebrated five years of its Leaders in Innovation Fellowships (LIF), which have provided unique support for over 1000 entrepreneurs around the world, raising over $80 million in funding, more than 80 licensing deals and products, and 2500 jobs.

A strength of research and innovation ODA is that it works in combination with vital humanitarian support in the poorest and most fragile countries. Across government and with our many partners in the UK and overseas, my department will continue to deliver the outstanding research and innovation underpinning action for global good.

This report is part of our commitment to manage our funds in an open and transparent way. In what are often very complex and challenging scenarios we need to keep explaining our approach, what we could do better and our many successes.

George Freeman MP
Minister for science, research and innovation

> What this initiative has done to my family is so profound. I am able to appreciate the world of children, and I think I am learning good parenting. It has also challenged me to look at this crazy time I have found myself in through the positive lens of hope.
>
> Lutchenza, mother of four in Malawi

Overview

The Department for Business, Energy and Industrial Strategy has two research and innovation funds for international development:

Global Challenges Research Fund

GCRF 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 2020 the GCRF total spend was £392m.

From 2016–2021 a UK investment of up to £1.5 billion.

Newton Fund

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 2020 the Newton Fund total spend was £101m.

From 2014–2021 a UK investment of up to £735 million with 'match' from partner countries.

£392m
GCRF total spend in 2020

£101m
Newton Fund total spend in 2020

Portable testing kits for developing countries

What we set out to achieve

Our mission is to use knowledge and technology to address development challenges for people living in low- and middle-income countries.

GCRF and Newton Fund work in different ways. They each have a 'theory of change' setting out the rationale for our programmes and the expected results over time. A simple unified theory of change is also available from www.newton-gcrf.org.

Broadly, the expected impact will be the widespread use of UK supported research and innovation to help people in low and middle-income countries.

This will:

- Help us to make progress towards United Nations' Sustainable Development Goals
- Improve capabilities for research and innovation around the world
- Create the networks and opportunities for groups of researchers to work together on specific challenges
- Enhance people's welfare and create opportunities for them
- Improve governance, policies and practices
- Reduce gender inequalities

These projects are delivered by our UK and international delivery partners, responsible for the operational design, disbursement and management of the funds.

They funded a wide range of activities, including:

- Research studies, from basic science through to applied research and innovation via small-, medium- and large-scale projects
- International partnerships, between institutions and the partners themselves, with other funders in low- and middle-income countries
- Innovation and technology accelerators
- Research capacity building through fellowships and PhDs. And through technologies and information technology systems
- New networks of people working on specific themes or in certain regions of the world
- Commercialisation of research and innovations
- Engagement activities, including policy talks in low- and middle- income countries.
- Block funding to UK universities and institutions to deliver costed GCRF strategies, including developing low- and middle- income partnerships and developing capacities
- Large investments that combine manyof these activities in multi-year interventions. For example, the GCRF interdisciplinary Hubs

In 2019 there were over 2,000 individual GCRF and Newton Fund projects active across at least 78 ODA eligible countries.

“In financial year 2019–2020 we allocated a budget to eight UK delivery partners and the UK higher education funding councils for England, Scotland, Wales and Northern Ireland. Our partners distribute funding to research institutions in the UK and internationally based on a competitive process. In the case of Newton Fund, programmes are designed and delivered in collaboration with funding partners in middle income countries and each programme is match funded.”

2019–2020 Headlines

6% Total UK Official Development Assistance allocated to BEIS

78 DAC-listed countries reached

2000 Individual projects funded

84% Award holders who told us the partnership is fair

373 Fellowships funded*

184 Intellectual Property created

13 Spinouts created

11,479 Journal publications**

31,334 Creative, policy and technology outputs**

* In 2018–2019 delivery partners reported 357 fellowships (revised down from 611 as originally reported).

** Over the life of the funds

Key performance indicators

Research and innovation in the field of international development is long term, complex and challenging. We are working closely with partners to develop key performance indicators.

We are starting with five:

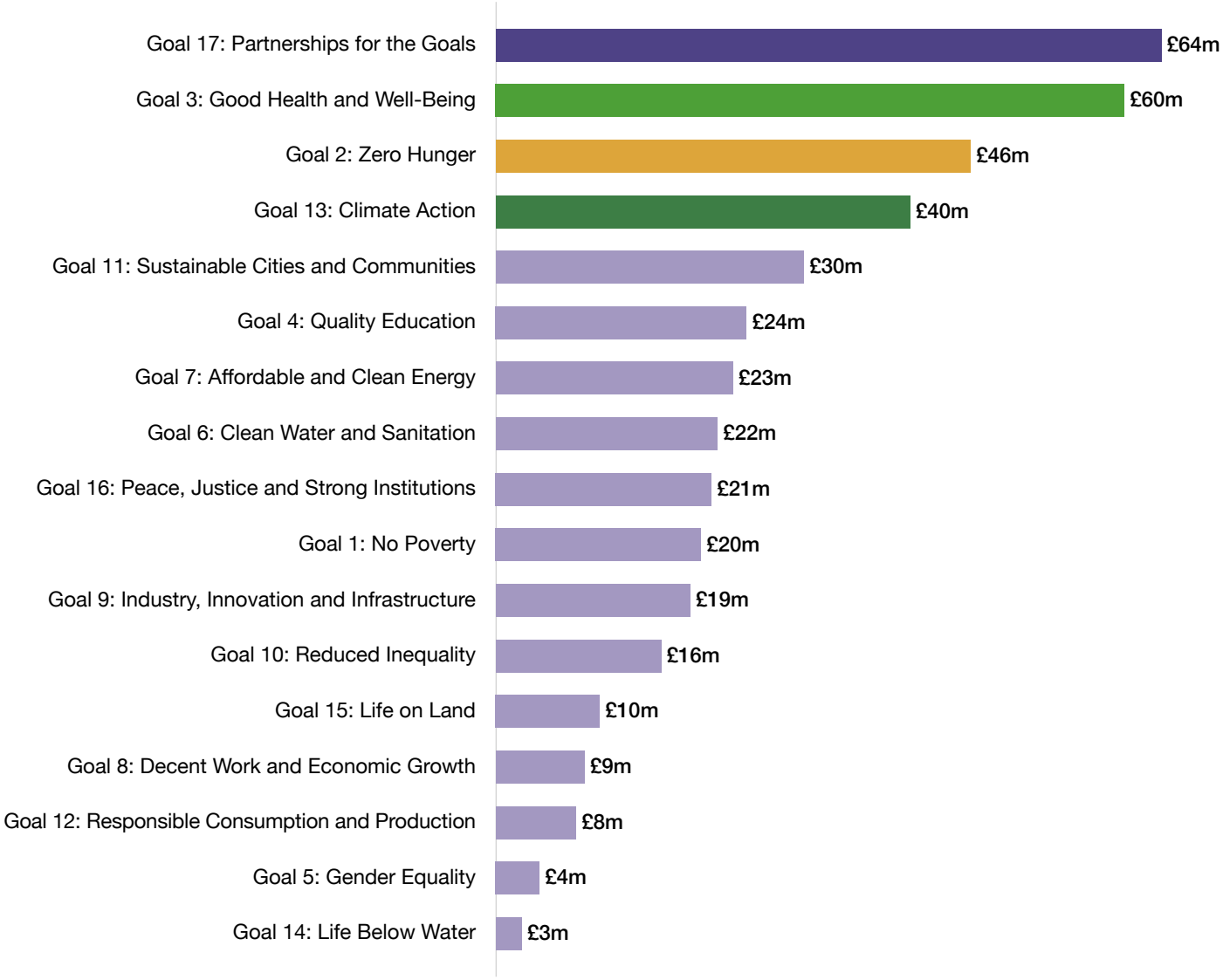
1. Activities addressing each Sustainable Development Goal and total value
2. Proportion of projects addressing each GCRF Challenge Area and total value
3. Number of fellowships and corresponding grants funded under both funds
4. Instances of intellectual property protection each year
5. Instances of spin-out companies each year

Sustainable Development goals

The 2030 Agenda for Sustainable Development was adopted by all United Nations Member States in 2015. It includes the 17 Sustainable Development Goals (SDGs), which recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequalities, and improve economic growth.

Our top SDG themes in 2020 across both funds were Partnerships, Good Health and Wellbeing, Zero Hunger and Climate Action.

Spending breakdown by SDG in 2020 for GCRF and Newton Fund



Source: Statistics on International Development: Final UK Aid Spend 2020
Note: Some spend can not be allocated to a SDG, e.g. call administration, delivery costs etc. or because the activity is too wide in scope. Figures are rounded up to the nearest million.

Global Challenges Research Fund challenge areas

The GCRF Strategy sets out 12 challenge areas which are linked to the UN Sustainable Development Goals (SDGs).

Challenge Areas 'translate' the 17 SDGs into research and innovation challenges. They guide how our delivery partners allocate funding.

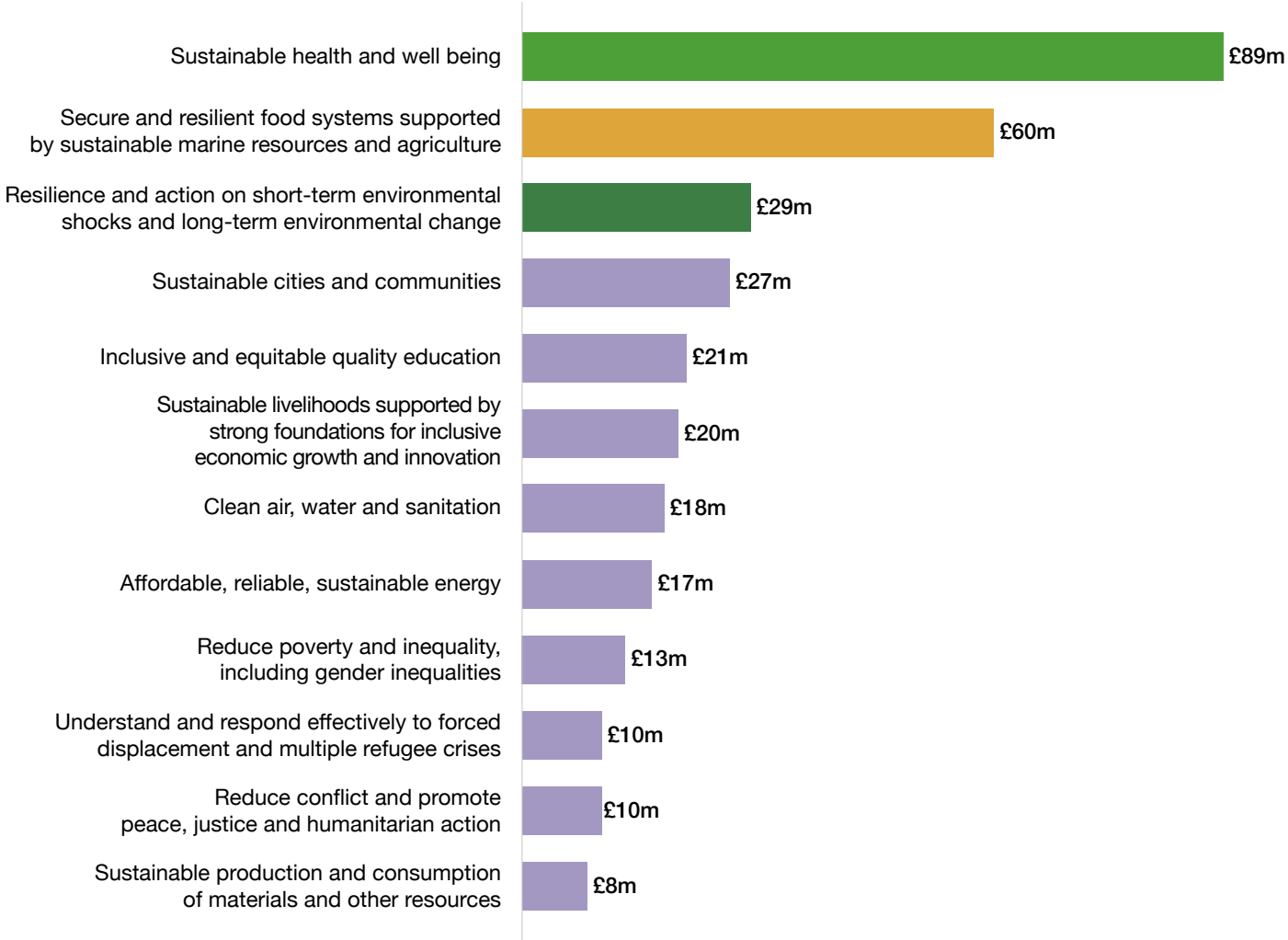
The top three challenge areas in 2019–2020 mirror the SDGs above. They were:

1 Sustainable health and wellbeing

2 Securing resilient food systems, marine resources and agriculture

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

Spending breakdown by GCRF challenge areas in 2020



Source: Statistics on International Development: Final UK Aid Spend 2020
Note: Some spend cannot be allocated to a challenge area, e.g. capacity building, call administration, delivery costs etc. Figures are rounded up to the nearest million.

Partnerships

Partnerships for cleaner air

Reducing pollution from vehicles could have a huge positive impact on air quality in India and across the world.

The Innovating for Clean Air programme brings together businesses, local authorities, academics and civil society organisations to develop interventions that have the potential to improve air quality. This included supporting the government of India's FAME scheme to accelerate the adoption of electric vehicles, and trialing other activities to improve urban air quality.

Over 20 Indian and UK small and medium enterprises were supported through the project. More than 10 projects were funded, and more than 5 high level agreements were cemented between UK and Indian organisations.

The project serves as a model for the UK and India working together to tackle climate change in the future, and for the benefits of international research and innovation collaboration.

Partners

From the UK, the programme was funded by Innovate UK, part of UK Research and Innovation (UKRI), through the Newton Fund and delivered by Energy Systems Catapult, Connected Places Catapult and Satellite Applications Catapult.

From India, it was a partnership of matched resources with various organisations, including: Bengaluru Traffic Police, Climate Centre for Cities (c-cube), CSTEP, C40 Cities, Citizens for Sustainability, Confederation of Indian Industry, Directorate of Urban Land Transport, Bengaluru, Enzen, Everything Eco, EY, Fields of View, Global Business Inroads, HSBC, India Energy Storage Alliance, Indian Institute of Science, Indian Institute of Information Technology, Benagluru, India National Institute of Urban Affairs, India Smart Grid Forum, Karnataka State Pollution Control Board, Niti Aayog, Project Lithium, Quanzen, Rocky Mountain Institute, SELCO Foundation, Sensing Local, Shakti Sustainable Energy Foundation, Shell E4 Programme, TechUK, The Automotive Research Association of India, UK India Business Council, Urban Morph, Valluri Tech Accelerators, World Resources Institute.

Parenting in a pandemic

The COVID-19 pandemic has placed families under extreme stress. UNICEF reports have shown a global escalation of child abuse. The UK Research and Innovation GCRF Accelerate Hub led an urgent response, with a coalition of WHO, UNICEF, the Global Partnership to End Violence, USAID and the US Centers for Disease Control and Prevention.

Professor Lucie Cluver (University of Oxford, University of Cape Town), Dr Jamie Lachman (University of Oxford) and their team co-developed a set of open source COVID-19 parenting resources.

In just a few months these resources reached over 86 million families in 180 countries worldwide.

The project condensed evidence from multiple randomised trials of child abuse prevention programmes in low-income countries. In March 2020, worksheets were endorsed by all collaborating agencies, and released onto the WHO and UNICEF COVID-19 websites.

Good health and wellbeing

All over the world, people have developed innovative ways to reach families with these resources, including:

- In Malawi, a pastor at Forgotten Voices read guidance aloud on national radio to eight million listeners
- In Sri Lanka, Montenegro and South Africa, the resources are being delivered in food parcels
- In Paraguay, the First Lady has distributed the resources online, with over a million views
- Romania thousands of social workers and 11,000 foster families have been trained to use them
- In Laos, UNICEF and the Lao government are sharing them on TV, radio and using community loudspeakers to more than half the villages in the country
- In Sub-Saharan Africa, the Internet of Good Things has delivered the resources at no data cost

Zero hunger

Overcoming food poverty in South Africa

Many South Africans still experience poverty and food insecurity. One in four children display stunted growth, an indicator of chronic malnutrition. This, despite a comprehensive social protection system, and a monthly child support grant which reaches two-thirds of all children.

Through the South African Research Chairs Initiative, Professor Stephen Devereux assessed how children, informal workers and farmworkers in South Africa are reached, and adequately protected against poverty and hunger.

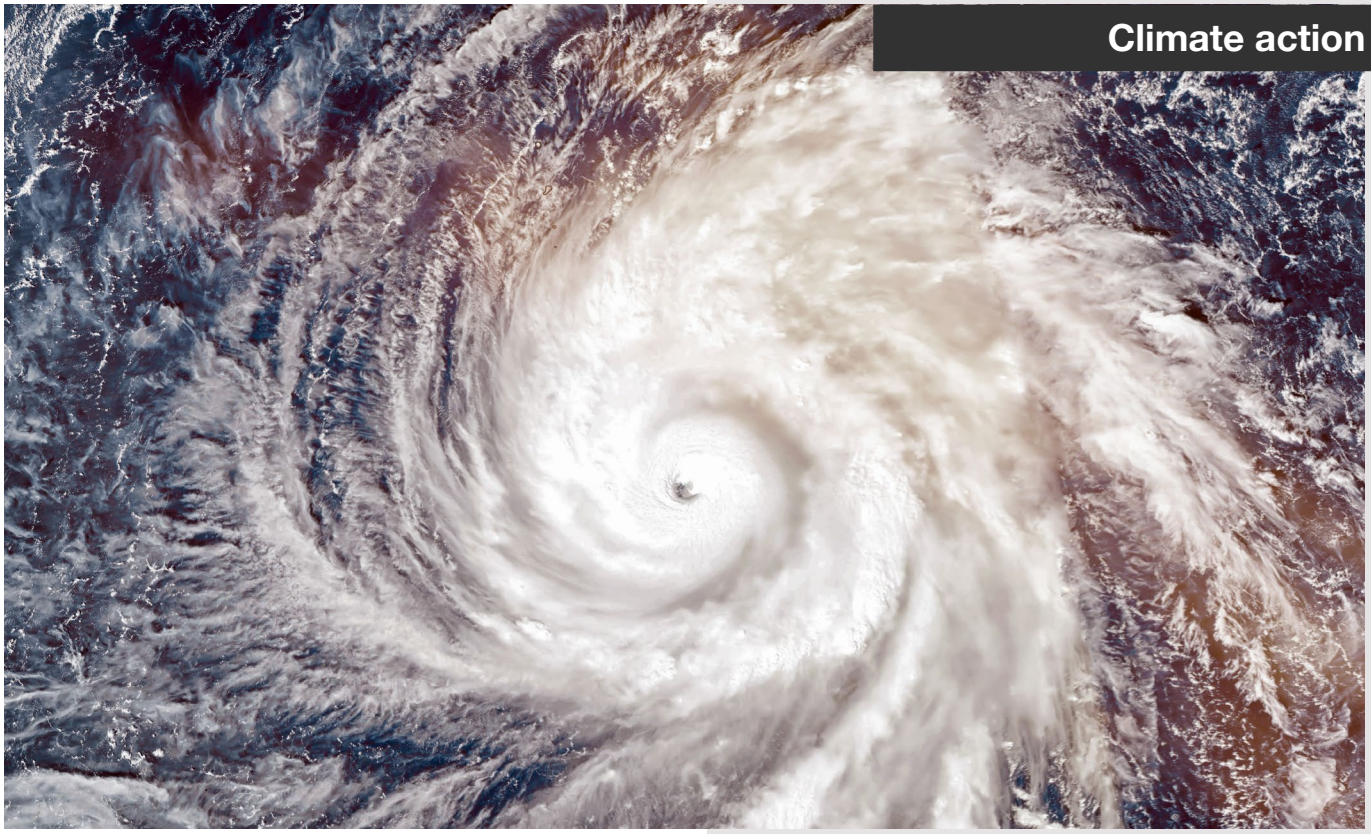
Working with academia, government, civil society and neighbouring countries, Professor Devereux has made considerable progress towards improving social protection strategies and influencing public policy. The research has led to revision of the social protection chapter of the National Food and Nutrition Security Plan for South Africa.

Farm workers were identified as a highly vulnerable but neglected group. A collaboration with the non-governmental organisation Women on Farms Project uncovered widespread violations in minimum wages, living conditions, health and safety as well as seasonal hunger.

Having launched South Africa's first national conference on the future of farm workers, Professor Devereux presented a proposal for seasonal unemployment insurance to the Minister of Employment and Labour. The results of his farm worker labour rights violations research were also influential during a parliamentary select committee hearing in South Africa on the National Minimum Wage Bill.

The wider consequences of COVID-19 in South Africa are not yet fully understood. The next phase of this research will generate new evidence and draw on lessons learnt to improve social protection interventions and outcomes in future crises in South Africa and elsewhere.

This National Research Foundation and British Council initiative was shortlisted for the Newton Prize 2020.



Making life-saving weather forecasts

Weather forecasters in Africa are getting access to satellite data that will allow them to track the path and severity of developing storms – and reduce the death toll from extreme weather events.

The GCRF African SWIFT project has enabled meteorologists to make accurate, hour-by-hour forecasts as severe weather approaches, a technique known as 'nowcasting' – very-short-range weather forecasting.

The technique is based on satellites monitoring changes happening in the atmosphere. It just takes 15 minutes for the information recorded in space to reach the forecasters' desks.

The continent is prone to sudden and extreme weather but forecasting those events is difficult. It is reported that between 3,000 and 5,000 people fishing on Lake Victoria die each year after being caught in severe storms.

Using the satellite data, forecasters will be able to see what the weather is currently doing and predict what will happen over the next couple of hours as well as after the storm, to help direct rescue and clear-up operations.

Nowcasting will not only save lives but help protect the economy.

African SWIFT, funded by UKRI's Natural Environment Research Council, is a partnership between the National Centre for Atmospheric Sciences at Leeds, the University of Reading, academics and researchers and meteorological agencies in Ghana, Kenya, Nigeria, Senegal and the UK's Met Office. The programme aims to deliver a step change in African weather forecasting capability and communication to protect the lives and livelihoods of African people while improving the economies of their countries.

Fellowships

Transforming cooking to improve air quality

Cooking should be a safe and healthy skill, but it is costing the health, and even the lives, of women in Kenya and much of Africa. Cooking fuels, such as wood or charcoal, can contribute to household air pollution increasing women's risk of lung cancer and chronic-obstructive pulmonary disease compared with women who use cleaner fuels to cook. In 2016, estimates for Kenya indicate that 14,000 deaths were attributable to poor household air quality.

Kanyiva Muindi is a FLAIR Research Fellow and an Associate Research Scientist at the African Population and Health Research Center (APHRC) in Kenya.

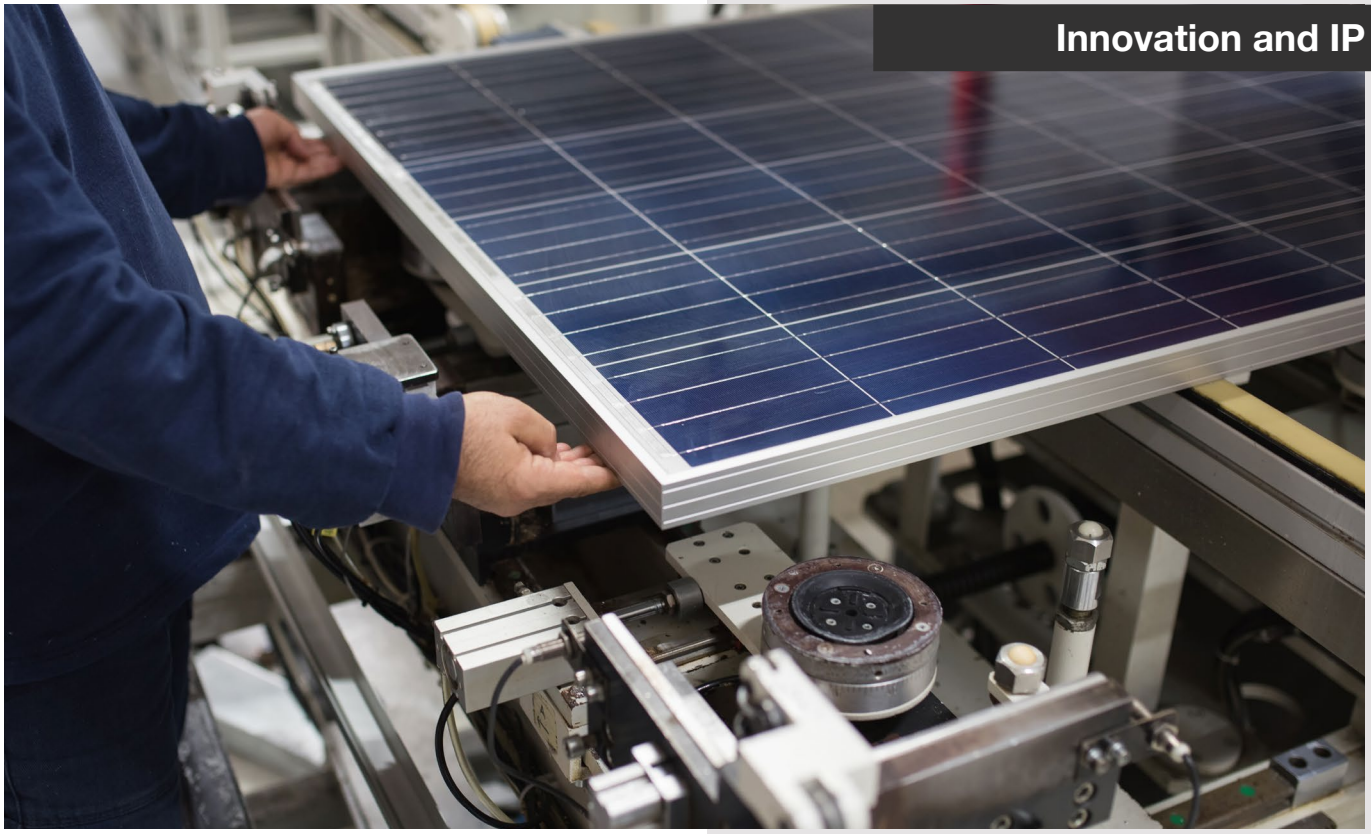
She won her Future Leaders – African Independent Research (FLAIR) Fellowship through her drive to make a difference to the lives of women in her county and eventually across the African continent. She set out to provide an alternative cleaner burning and affordable fuel, ethanol, to rural households to reduce the burden of household air pollution. This has the potential to transform cooking practices (and livelihoods) across the continent, with the associated health benefits.

The FLAIR fellowship is giving Kanyiva the opportunity to grow a team and possibly establish an environmental health research unit in Kenya. Given the numerous environmental challenges that Kenya faces, the possibilities of impact for this unit will be immense. Her research will inform the best approaches to use when scaling up ethanol stoves in rural communities, not only in Kenya but throughout Africa.

These fellowships are offered to talented African early career researchers who have the potential to become leaders in their field. The Fellowship is a partnership between the African Academy of Sciences (AAS) and the Royal Society, supported by the Global Challenges Research Fund (GCRF).

Fellowships are an important type of grant across all our delivery partners. They help support and develop the careers and skills of researchers based in low- and middle-income countries.

Kanyiva Muindi



Innovation and intellectual property

Some delivery partners focus more on supporting innovation rather than traditional research studies. Their outputs develop technologies, products and services, as well as spin-out companies that are established to take these innovations to scale.

Our key performance indicators aim to track these outputs by counting the instances of intellectual property protection and spin-out companies arising from our awards.

Due to the type of activity and relevance of this KPI to a few delivery partners, most came from the Royal Academy of Engineering, Royal Society and UKRI.

In 2018–2019 delivery partners reported 20 spin outs (revised down from 35 as originally reported) and 98 instances of IP (revised down from 161 as originally reported).

Supporting innovation in 2019–2020 with

184 instances of unique intellectual property protection and

13 spin outs

Spin outs

Earth and sea observation

The Earth And Sea Observation System (EASOS) provides decision-making support to governments to help tackle environmental, security, and human challenges. Data from terrestrial and satellite sources provides knowledge to government departments. Through innovative integration of population statistics, a true picture of risks can be created by using infrastructure data such as road networks, railways, government buildings and emergency centres.

The EASOS platform, developed in collaboration with Malaysia, offers three services: Flood Watch, Marine Watch, and Forest Watch. Delivering high-value 'decision support' through a series of applications, the system is almost entirely automated, reducing cost, and mitigating delays.

EASOS automatically provides flood forecasts every 6 hours (4 times a day) and up to 7 days in advance. It has detected over 3,000 hectares of deforestation in two areas of interest, and has helped identify and map the trajectory of three oil spills, saving clean-up costs of over £3M.

The platform continues to evolve and develop. This includes using EASOS core technology components to support a major food supply chain sustainability initiative (ForestMind) and enhancing future potential environmental monitoring programmes across marine, mining and deforestation applications.

The EASOS project was funded by the UK Space Agency's International Partnership Programme, supported by GCRF. EASOS is a system produced by an industrial and academic consortium led by the Satellite Applications Catapult – a company created by Innovate UK, part of UK Research and Innovation.

Portable testing kits for developing countries

Commercialisation

Researchers at Brunel University London, the University of Surrey and Lancaster University have created a molecular test kit and smartphone app from a UK Research and Innovation project.

Led by Professor Wamadeva Balachandran from Brunel University London, the new kit can tell people if they have COVID-19 in around 30 minutes.

The original project was one of four shortlisted for the UK-Philippines Newton Prize in 2019. It created a diagnostic platform and surveillance software for farms to detect infectious pathogens in poultry.

Professor Balachandran and the team realised that their ability to test for viral and bacterial pathogens in poultry could be recalibrated to test for COVID-19.

It works by linking a test kit to a smartphone app. Test swabs go into the kit, which then runs a test for COVID-19. It feeds the information into the smartphone app, which will then give results in around 30 minutes.

It can run up to six different swab tests at the same time.

The team has joined forces with GB Electronics (UK), Inovo Robotics and Unique Secure to manufacture two versions of inexpensive, rapid, diagnostic test kits.

The kits can be used in areas with large concentrations of people – such as care homes, sizeable employers and airports – to quickly determine if an individual has the virus.

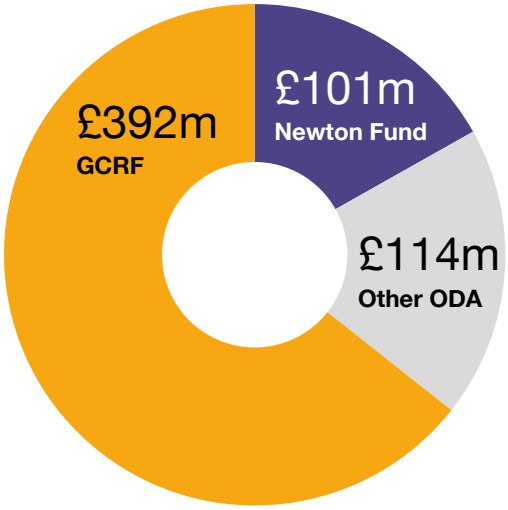
Crucially, because of their inexpensive nature, the kits will make testing for COVID-19 much more accessible in developing countries.

These new partnerships will allow the team to scale up their production and supply test kits all around the world, including developing countries. These have remote communities who may not have easy or immediate access to high-quality medical facilities.

Financials

An overview of our financial data for this year and previous years, and breakdown of spend for each delivery partner.

2020 calendar year spend by fund: Total spend £607m



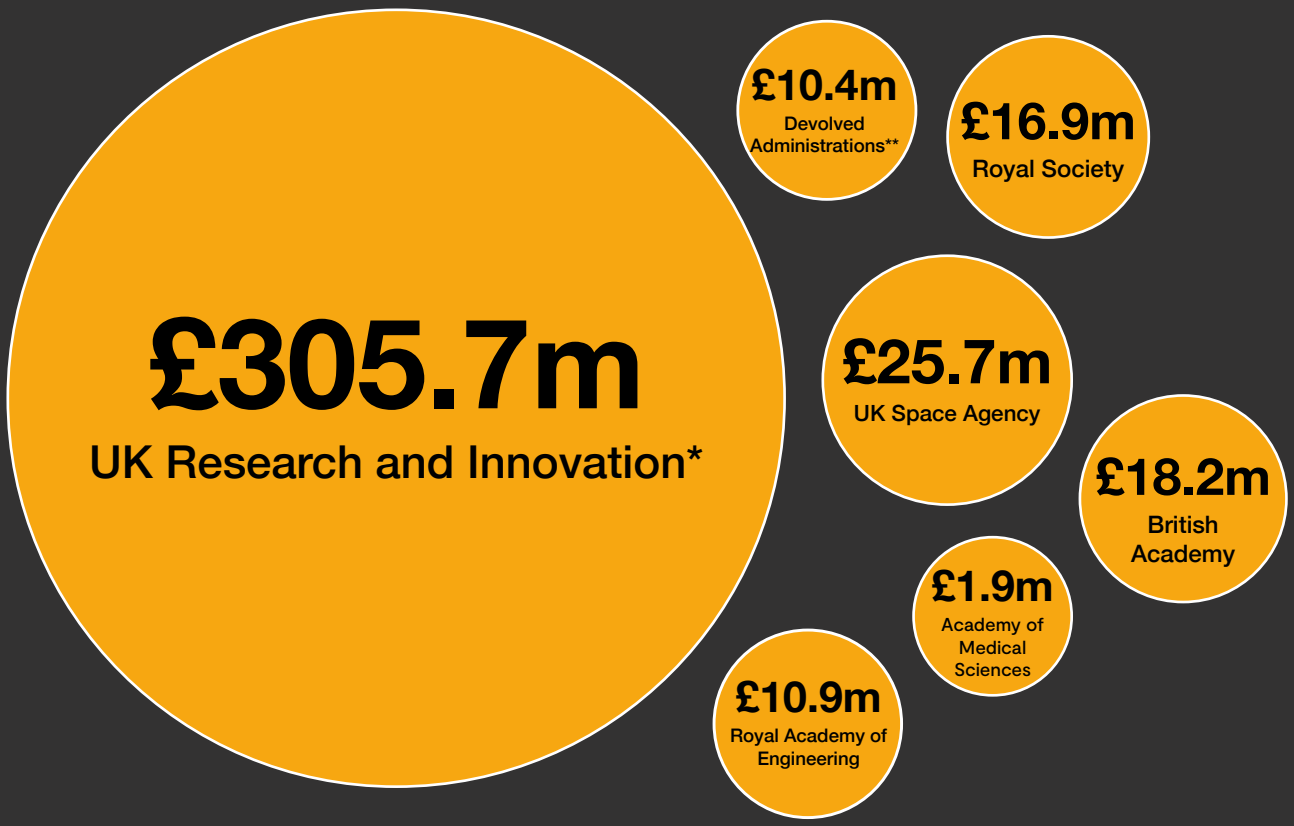
Other ODA is a target set by HMT against which BEIS reports ODA eligible activity from core (non-ODA) BEIS R&D spend.

Calendar years spend by fund in previous years

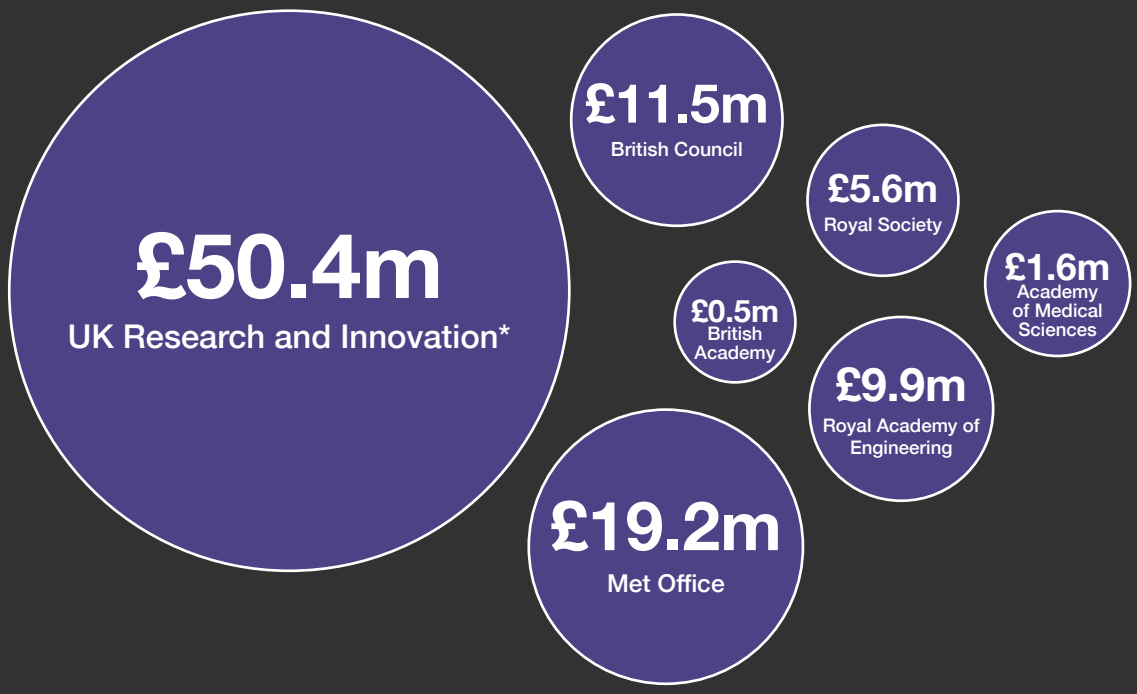
	2016	2017	2018	2019
GCRF	£72m	£180m	£262m	£362m
Newton Fund	£92m	£102m	£120m	£119m
Total	**£164m**	**£282m**	**£382m**	**£481m**

2020 calendar year spend by delivery partner and fund

Global Challenges Research Fund

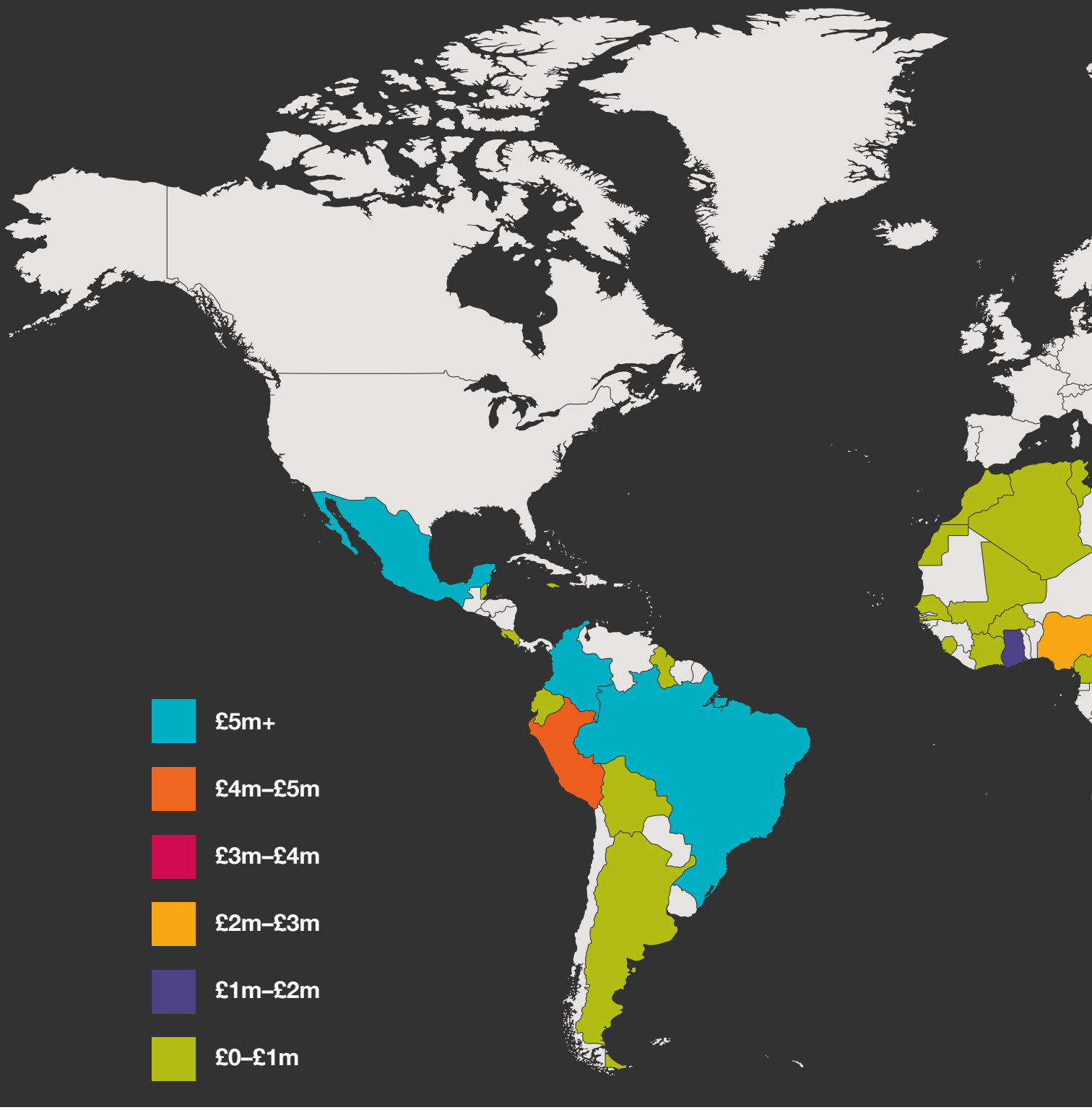


Newton Fund



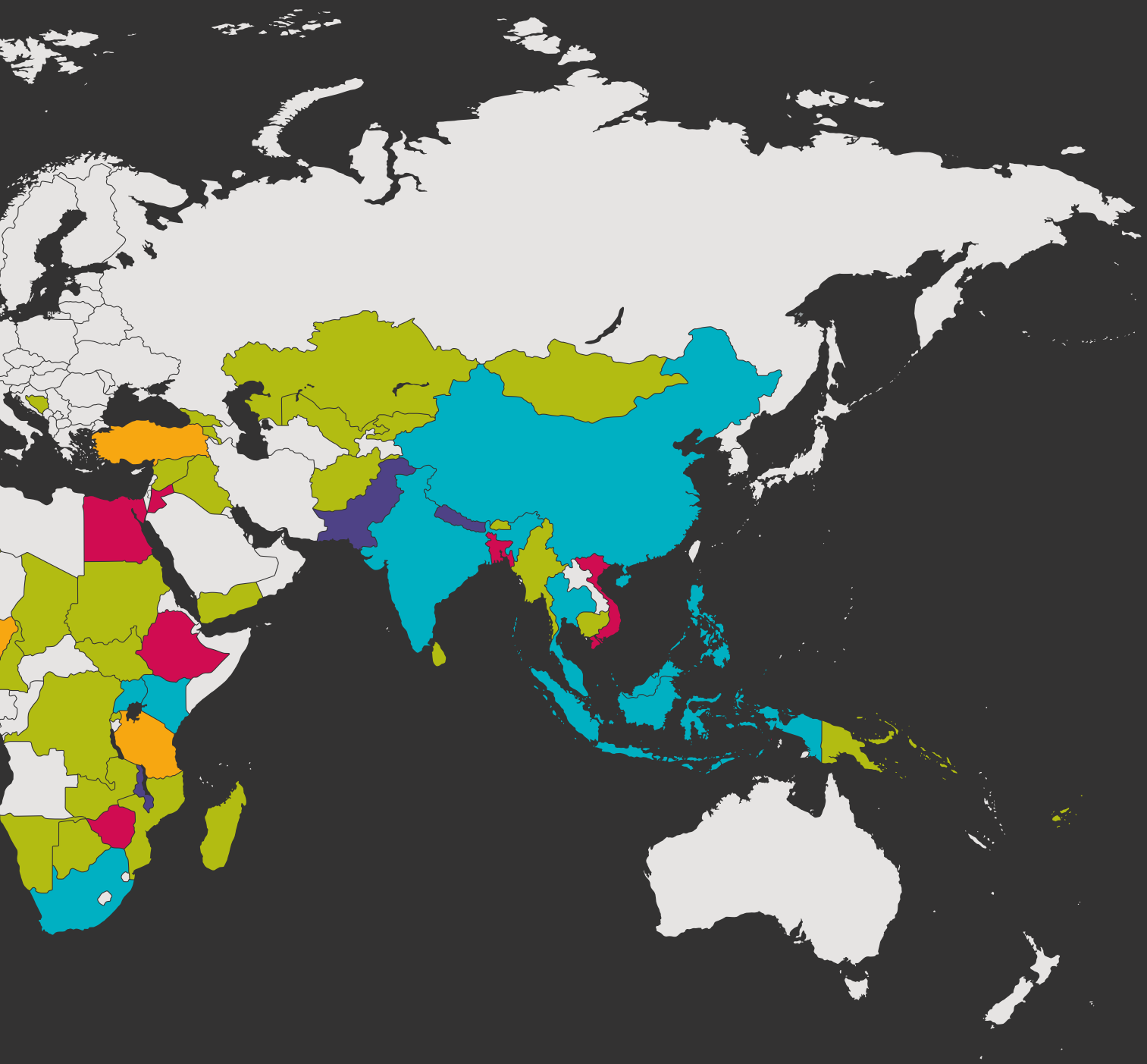
* UKRI comprises nine of the UK's leading funding councils: Arts and Humanities Research Council, Biotechnology and Biological Sciences Research Council, Economic and Social Research Council, Engineering and Physical Sciences Research Council, Innovate UK, Medical Research Council, Natural Environment Research Council, Research England, Science and Technology Facilities Council.

** Devolved Administrations: Higher Education Funding Council Wales, Northern Ireland Executive, Scottish Funding Council



Reach and outputs

Breakdown of combined spend for GCRF and Newton Fund in 2020



Source: Statistics on International Development: Final UK Aid Spend 2020

GCRF and Newton Fund target low- and middle-income countries (LMIC). Today's most pressing global development challenges such as inequality, pandemics and climate change - transcend national borders. We need to work with researchers and communities in LMICs if we are to achieve globally sustainable poverty reduction.

Countries associated with funding may reflect activities either taking place in that country, and/or activities that are deemed to be relevant to that country's development challenges but taking place elsewhere, such as the UK.

The UK works in partnership with China and India respectively to deliver global development impact; addressing challenges that are relevant to developing countries around the world.

Spotlight on our approach to value for money

We've been working with our funding partners and Tetra Tech to find the most appropriate way to conceptualise and assess value for money. Our pilot takes a sample of projects and programmes (multiple projects under a given theme) through a peer/expert assessment based on specific criteria.

Lessons learnt

Assessing value for money

It is difficult to tell how much 'benefit' can be attributed to one project. This is compounded by the timeframes involved. Impact may not be seen for years after the project has completed. Our theories of change posit long-term impact at 10 to 15 years.

This situation is not unique to the Newton Fund and GCRF. Many other funds within research and innovation for development are grappling with the same challenges.

Our approach recognises these challenges by bringing together both quantitative and qualitative evidence and to look at different facets of a project through a rubric – such as the impact already achieved and the likelihood of impact after the project has finished.

Embracing risk

Researchers must be able to learn and build on the unsuccessful attempts of others. Supporting transformational research and innovation means taking risks, knowing that some attempts will fail and others may be highly successful.

Large research funds such as the Newton Fund and GCRF use a 'portfolio approach' to manage this risk. This means funding many projects to tackle one problem. Our work to assess value for money aggregates results accordingly. Instead of looking at one project and making a judgement, we look at ten or twenty. And in this way, we stand a better chance of making an assessment of what has been achieved overall.

Every project is different

Every development project is different from others. Projects have different aims, methods, stakeholders, scale, budget and context. We must allow for comparability while accounting for such diversity.

Our value for money approach has a characterisation step. Projects are characterised based on their own aims to enable the most appropriate application of the rubric. For example, a health project that has capacity-strengthening as its aim would be assessed on that basis. A health project without capacity-strengthening as its aim would be assessed on something else.

Beyond outcomes

The principles of fair and equitable partnerships are at the heart of the GCRF and the Newton Fund. That is, the principles of putting poverty reduction first, investing in relationships, breaking down hierarchies and a commitment to transparency.

Consider two research projects that achieve similar outcomes. Project A costs more because it uses resources to further equitable partnerships. Project B costs less but does nothing to further equal partnerships. Clearly project A is better in the sphere of international development, but a typical cost-benefit analysis would favour project B based on the numbers alone.

Our approach accounts for ways of working (process) as well as outcomes – with equitable partnerships forming part of our assessment.

Case study

Fighting neglected tropical diseases in Brazil

Schistosomiasis is a parasitical neglected tropical disease caused by a parasitic worm that lives in fresh water. It affects areas of Brazil and numerous tropical countries in Latin America, Africa and Asia. A collaboration between the Oswaldo Cruz Institute and the London School of Hygiene and Tropical Medicine aims to build the capacity of researchers working on schistosomiasis research through research visits and exchange, including training in the use of specialised equipment available in UK laboratories. Through the application of protein purification methods, it seeks to support testing of different chemical substances and their potential to result in innovative treatment for schistosomiasis.

According to both the UK and Brazilian sides of this partnership, it would have been difficult to carry out this and the preceding collaboration in the absence of the Newton Fund. This is because of the Fund's specific focus on meeting development priorities, including through work on neglected tropical disease. And without a partner in a country affected by these diseases it would have been difficult to find a source of funding in the UK, where such diseases are not prevalent or high-priority. Funding in this area is limited and very competitive. Bringing in a foreign match, however, where the issue is more prevalent, can help make work on neglected tropical disease more feasible and more attractive for UK partners.

Capacity building and profile raising did not occur in a one-sided way: the UK participants were seen as equally benefiting from collaboration with Brazilian partners, for instance through access to strong networks in areas of research excellence in Brazil. The possibility of in-country visits enabled UK researchers to take part in workshops, conferences and events where they could meet potential other collaborators, as well as potential funders.

Our approach is learning-oriented

Value for money assessments are crucial for ensuring the effective use of public money. They generate important evidence on whether programmes are delivering what they set out to deliver. But they can also tell us things about how we measure value for money.

We conducted four pilots of our approach throughout 2020. The richness of the data in the sampled projects coupled with analysis from the peer/expert panels allowed us to look for strengths and weakness in our assessments.

In our pilots the majority of projects (48 out of 57) were found to be acceptable and good. Five scored excellent and four scored poor. This is consistent with our literature review on the value for money of research for development projects. It suggested that funds should take a portfolio approach to value for money, embrace risk and recognise that 'failure' comes with research for development. Within a portfolio of research projects, some will fail. Some will be successful. A few will be highly successful.

It takes time to consult and understand the complexities and challenges of demonstrating the value of research and innovation for development projects. But in doing so we hope to yield more meaningful assessments and ultimately result in better information, transparency and decision-making for these types of projects in future.

Remote sensing technology for crop production

China's rapid socioeconomic development has been accompanied by improvements in agricultural production efficiency. Heavy fertiliser use significantly improved crop production but it also led to unsustainable agricultural practice.

A collaboration between Newcastle University, China National Engineering Research Centre for Information Technology in Agriculture (NERCITA), Tsinghua University (China), Southwest University (China), China Academy of Space Technology (China), International Centre for Maize and Wheat Improvement (Mexico) aims to achieve sustainable intensification of China's agriculture using remote sensing technology. Doing so could help reduce the use of artificial fertilisers and environmentally damaging practices, improve food security, and provide economic benefits.

The project created new partnerships between Newcastle University and NERCITA. The UK selection procedure linked the various project partners together and opened the door for Newcastle University to apply their remote sensing expertise to agriculture. One interviewee reported that they felt there had been lots of opportunities through the collaboration to establish connections between UK and Chinese researchers at different levels, including reciprocal visits and the participation of early-career researchers.

There have been at least 16 instances of additional funding secured by the project team for associated research work, totalling several million pounds. One interviewee noted that this project had resulted in a 'significant return to investment' in terms of additional research funding.

Developing new therapies for head and neck cancers

A project led by Wellcome Trust Genome Campus and Cancer Research Malaysia was designed to tackle cancer of the oral cavity, which is one of several types of head and neck cancer. This cancer is seen as one of the biggest public health issues in Malaysia, as well as in Asia generally, and has increasing incidence in the UK. It is expensive and difficult to treat, leading to significant morbidity with survival rates that have not improved for several decades.

The expected long-term impact of this project is the production of treatment, or a vaccine, tackling oral cancer and potentially of other head and neck cancers. If successful, the vaccines would help transform treatment of head and neck cancer, and would also benefit cancer therapy more broadly. Potential impact from a vaccine could result in the reduction of costs and difficulty of treatment of this type cancer, ultimately leading to fewer deaths and improved quality of life among cancer patients.

The scope of this research as well as the quality of the partners attracted to take part in the gene editing and building of global databases would not have been possible without UK funding, which brings together academics and private research partners from both the UK and Malaysia. The size of financing provided through our funds is also noted as an enabling factor – experiments of the kind undertaken in this project are too expensive for non-governmental actors to fund.

The project has also strengthened the perception of the UK as a champion in gene editing technology and research and solidified the people-to-people networks in this research domain, allowing for a seamless integration of UK-schooled Malaysian talent into research institutes in Malaysia. The success of the project has also heightened the interest of current Malaysian students finishing their education in the UK to return and contribute their freshly gained knowledge into ongoing neck and cancer research done in Malaysia. This is especially attractive to them as they are aware that Malaysian research institutes have strong links with the UK, and they perceive that they will be able to continue working with British expertise.

Department for Business, Energy & Industrial Strategy

GCRF

Newton Fund