

# Accelerating International Development through UK Science and Technology: What Difference is the UK Making?



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This document aligns with the government's ambitions for the sector, as laid out in its white paper on international development.<sup>1</sup> Through examples across several key areas, it states the case that investment in research powers transformative international development. It shows how the UK's track record, expertise and diplomacy make it the pre-eminent player in this space and sets the merit of maintaining this position: that the research provides excellent value for money, benefitting people and economies both internationally and right here in the UK.

The world's poorest and most vulnerable face a mounting inventory of debt, food and energy insecurity, health and humanitarian crises, extreme weather and ecosystem collapse. They cannot afford to waste time and resources tackling existential issues with ineffective interventions.

However, when governments and researchers around the world work together to address these challenges, substantial benefits can be unlocked across continents. To achieve this, global society must recognise the value of investing in high-quality development research, generating evidence of what works to benefit the world's poorest people.

The UK has significant scientific, research and innovation capabilities that can help deliver an ambitious international development agenda within complex geopolitical and financial constraints. In 2021, the Chancellor announced plans to increase Official Development Assistance (ODA) spending on research and development (R&D) from £600 million to £1 billion by 2024/25, representing around 4.5% of total public investment in R&D.<sup>2</sup> What's more, in 2024/25 alone, the UK is committed to spend around £2.5 billion of International Climate Finance, part of an overall commitment of £11.6 billion from 2021/22 to 2025/26.<sup>3</sup>

To ensure that UK spending delivers the greatest impact for global development, it must make use of new technologies that are grounded in science and clear ‘what works’ research and evidence.

Collaboration is also crucial. In our volatile world, science, research and evidence remain a shared language for cooperation. Equitable collaboration propels the progress of science and technology and, thanks to its global ecosystem of partnerships between universities, businesses, the private sector and civil society, the UK remains at the forefront of international research. Indeed, across many indices, including those for universities, UK research and development is world leading.

## **1. Science, new technologies and ‘what works’ evidence have driven major advances in international development and should be central to the UK’s future approach.**

### **How clean energy technologies and science-based, climate-resilient agriculture and food systems tackle the global climate crisis.**

UK research on climate modelling, extreme weather forecasts and greenhouse gas emission estimates have all informed reports by the Intergovernmental Panel on Climate Change. The UK’s International Climate Finance commitment – which funds research and innovation in this sector – has helped more than 57 million people cope with the impacts of climate change and generated or protected ecosystem services with a value of £5.3 million.<sup>4</sup>

#### ***UK-supported research on climate-smart agriculture and food systems.***

Research by the UK-funded CGIAR’s International Potato Center has led to climate-smart, biofortified crops, such as an orange sweet potato that’s high in provitamin A, improving the micronutrient intake of more than 20 million people – particularly preschool children and women – in over 40 developing countries. This crop can positively affect the lives of one billion people by 2030.<sup>5</sup>



The UK has a proven reputation for providing evidence for digital innovation that positively impacts international development. FCDO research on financial inclusion led to the successful introduction of M-PESA, a project which also demonstrates the value of long-term engagement. It overcame short-term difficulties in demonstrating impact, and now helps over 50 million often hard-to-reach users across East Africa and Asia easily access cheap and reliable money transfers.<sup>6</sup> This expertise is now being applied to tackle the climate crisis, as FCDO research supports FSD Africa with the Carbon Value Exchange, connecting UK companies with carbon offsetting projects and finance innovators across Africa, as domestic households switch to clean energy stoves.

### **How breakthroughs in health and medical technologies save and improve lives and create global impact.**

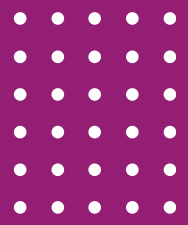
New, UK-funded vaccines and medicines have saved millions of lives and accelerated development. The West African Ebola crisis from 2014 to 2016, for example, was contained thanks to international cooperation – that brought about biomedical interventions, faster vaccine development and intelligence drawn from social science.<sup>7</sup> The UK played a leading role in this global partnership, committing £427 million to the effort.<sup>8</sup>

#### ***UK research partnerships tackling the global burden of malaria.***

UK research has supported key efforts to control and eradicate malaria, a global disease that is expected to spread as vector-borne disease patterns change in response to the climate. An international collaborative trial led by researchers at the London School of Hygiene & Tropical Medicine (LSHTM) could reduce clinical malaria by 30%.<sup>9</sup> Research led by the Mahidol Oxford Tropical Medicine Research Unit forms the basis of all current WHO treatment guidelines and has transformed the treatment of malaria throughout the world. Genetic sequencing by a team of UK, Zambian and Canadian researchers revealed an unexpected prevalence of daytime outdoor malaria mosquitos in the Upper Zambezi River floodplains. The researchers developed malaria transmission maps that support global malaria elimination strategies.

### **How ‘what works’ research and new technologies ensure opportunities for all.**

UK-funded ‘what works’ research has played a critical role in policies that have shaped girls’ education<sup>10</sup> and halved domestic violence against women.<sup>11</sup> High-quality, robust evidence such as this needs to underpin the UK’s approach to international development, as well as the actions of partner governments and civil society organisations.



**Unlocking education through tablet technology in Malawi and the UK.**

Between 2014 and 2021, 225,000 disadvantaged children in Malawi received writing, reading and maths support from onecourse, a tablet app developed by the NGO onebillion in partnership with researchers from the University of Nottingham and supported by Malawi's Ministry of Education. In addition, the accessible software has been rolled out to 126 UK schools (University of Nottingham 2021), improving students' educational attainment. By 2023, more than half a million children worldwide had benefitted from onecourse.<sup>12</sup>

**Improving global health systems through Participatory Action Research.**

The Verbal Autopsy with Participatory Action Research project combines verbal autopsies with local knowledge to improve the recording of deaths and enhance health services for marginalised groups in South Africa. Building on funding from the UK's Medical Research Council, community partners collect and analyse local data in cooperation with health workers, identifying health priorities and risks in communities.

A 2019 evaluation highlighted the project's role in building trust between rural communities and health authorities, with South African's Department of Health extending the intervention to cover 4.7 million people.<sup>13</sup>

One of the project's leads, the University of Aberdeen, has also conducted a UK NHS pilot study, and the approach could be introduced as part of NHS Grampian's strategy to empower communities in strengthening their own health systems.





## 2. Science is UK partnership in action, bringing together UK and international researchers, academic and philanthropic institutions, businesses and government-to-government collaborations.

### How equitable partnerships with researchers and innovators from affected communities give local people a voice in shaping their development solutions.

Increasingly, the UK is engaging in impactful science and research partnerships led by low- and middle-income countries towards mutually agreed priorities.

The UK, for example, is one of the largest investors in science and innovation partnerships with Kenya, funding approximately 300 projects across fields such as biomedicine and health technologies, climate and environment, and agricultural sciences, including research collaboration on COVID-19 and yellow fever that provided the WHO with the evidence to increase global vaccine stocks five-fold.

Wellcome and the FCDO co-fund Science for Africa’s DELTAS Africa programme, supporting African-led research consortia across 36 countries to address challenges such as infectious diseases, mental health disorders and the interaction between climate and health. Elsewhere, the cross-government Ayrton challenge programme works with more than 700 partners worldwide to support clean energy technologies and accelerate the transition to low-carbon energy in developing countries.<sup>14</sup>

These locally led and equitable partnerships develop early career scientists and the next generation of research leaders. Since 2017, partnerships supported by UK investment have supported over 1,000 individual career pathways in global health research – from postgraduate degrees to professorships – fostering research talent in low and middle-income countries and supporting a global research ecosystem that includes research managers, finance staff and local community engagement practitioners.



## How UK-funded research and innovation partnerships leverage private and philanthropic finance to ensure effective investment and sustainable impact.

### ***UK-funded research bringing benefits globally and on UK soil.***

A portable lab to test the safety of water has been developed by experts from Newcastle University and across Ethiopia as part of UK Research and Innovation's Global Challenges Research Fund.<sup>15</sup>

The Lab in a Suitcase allows researchers to quickly, easily and cheaply identify water quality and waterborne diseases at any location.

The team is now collaborating with universities in Tanzania, Brazil and Thailand to develop portable water analysis field kits. They have also secured philanthropic support to develop a mobile Lab in a Van to track sources of river pollution in north-east England and visit local UK schools to inspire budding environmental engineers.



UK academic and private sector expertise precipitates game-changing technologies, innovation and evidence that benefits hundreds of millions of people in lower-income countries. In addition, funding from philanthropic organisations and the private sector extends the impact of projects and ensures longer-term sustainability. For example, the Development in Africa with Radio Astronomy (DARA) and DARA Big Data programmes, led by the universities of Leeds and Manchester respectively, support international research infrastructure by providing radio astronomy training across sub-Saharan Africa. Both projects have gone on to achieve impact beyond the end of their funding schemes thanks to outside finance, with DARA alumni using private funding to develop their networks and a series of social, environmental and commercial spin-offs, including educational initiatives for schools in Ghana and Kenya, an ethical astro-tourism business in Kenya and several startups in Zambia.<sup>16</sup>



Overall, unique expertise and an extensive portfolio of partnerships gives the UK an outstanding value proposition as the world's leader in development research. This was recently demonstrated at an EU Horizon forum on research partnerships with developing countries where UK research, partnership and development principles were repeatedly highlighted as examples of best practice.

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### ***UK public-private research and innovation collaborations bring multiple economic benefits.***

A consortium comprising Brunel University, UK heat pipe manufacturer Econotherm, Brazilian maté tea producer Ervateira and Brazilian training company SENAI introduced a new method for drying maté tea leaves. The traditional technique releases carcinogens, but the collaboration yielded a more efficient manufacturing process that reduced the carcinogens to meet international standards – benefitting an estimated 1.4 million consumers – and expanded Ervateira's maté tea production by 25%.<sup>18</sup>

### **How long-term relationships and sharing of expertise underpin UK research partnerships.**

Working in partnership with host governments, the UK excels at effective science and diplomacy that brings about long-term reform. For instance, with staff in over 65 global locations, the UK's Science and Innovation Network builds science, technology and innovation collaboration across the world, including in the low- and middle-income countries of Africa and Asia Pacific, while the Science Granting Councils Initiative leverages UK expertise in partnerships between UK, African and other international funders. Initiatives such as these strengthen the institutional capability of public science funding agencies around the world and enhance relations between the UK and the nations with which it partners.

As such, science and research serves as a positive bridge for building collaboration and diplomacy with countries with which the UK does not have established relationships. This is particularly valuable for the UK's global middle ground agenda as many of the countries covered by this approach – Brazil, Indonesia, the Philippines, South Africa – can be included in development programmes.

### **How a coordinated and coherent approach across UK research for development funders enables bigger breakthroughs and enhances UK influence.**

The Strategic Coherence of ODA-funded Research (SCOR) Board was established in 2017 to support a coordinated and impactful approach across all government





Official Development Assistance (ODA)-funded research programmes and those of Wellcome. The UK Collaborative on Development Research (UKCDR) provides a secretariat for joint action by these funders and to the SCOR Board. At the onset of the COVID-19 pandemic, UKCDR and the Global Research Collaboration for Infectious Disease Preparedness launched the COVID CIRCLE initiative as part of the Global Effort on COVID-19 Health Research funding call, mapping global COVID-19 research funding and promoting research priorities relevant to low- and middle-income countries.<sup>19</sup> UKCDR also developed the MODARI platform to map all UK ODA research and innovation projects by organisation and country, helping these investments achieve greater coherence, local engagement and impact.<sup>20</sup>

UKCDR-facilitated collaboration has enabled the UK to demonstrate values that foster mutually respectful relationships and research cultures and support equity and diversity.<sup>21</sup>

### 3. The UK's shared benefit in tackling development challenges.

#### How UK international development research provides further value for money by bringing benefits back home.

The climate crisis and COVID-19 pandemic highlight how the fates and challenges of people around the world are intertwined. As such, the benefits of development research extend beyond recipient countries to generate wider global impact and value for money for the British public. The UK's prompt development of the AstraZeneca vaccine for COVID-19, for instance, was built on previous research for the Middle Eastern Respiratory Syndrome coronavirus.<sup>22</sup>

Another example of mutual advantage is research by the UK-funded CGIAR. Alongside producing a ten-fold return on investment (ROI) through greater food abundance, lower prices and reduced rates of hunger and poverty,<sup>23</sup> UK consumers and farmers have also benefitted as new technologies create sustained improvements in UK yields of crops, such as wheat, reducing food prices.<sup>24</sup>

While ROI is not a specific focus of this review, it must be noted that continued funding for development research offers major incentives for the UK's economy. The government is targeting domestic research and development activity worth £20 billion by the next financial year, and international development research is a core component of this target.<sup>25</sup> It helps achieve other spending targets, improving the efficiency of each £1 spent and yielding higher returns on investment.<sup>26</sup> And with the majority of this funding spent through UK institutions, it also supports high-value domestic economic activity.<sup>27</sup>

In addition, there is strong evidence that UK development research partnerships act as seed funding for UK organisations to establish footprints and build long-term relationships in partner countries.<sup>27</sup> This improves the UK's reputation, offers enhanced access to emerging markets and provides opportunities to influence the progression of global research and intellectual property markets.

***Technology transforming lives of people with communication and intellectual disabilities.***

Research by Manchester Metropolitan University on improving low-cost interventions in speech and language therapy brought together funding from diverse sources, such as Comic Relief, the Royal College of Speech and Language Therapists and the Nuffield Foundation Africa programme. The FCDO used the findings to fund research aimed at preventing violence against women and girls with intellectual disabilities in low- and middle-income countries. In the UK, the findings played an important role in developing training for over 500 UK healthcare workers, shaping services for refugees with communication disabilities.<sup>28</sup>



Thanks to an enviable foundation of scientific and technological innovation, the UK is a world-leader in development research that advances a shared international agenda. Yet it is capable of achieving even more. The UK has a clear and significant opportunity to further build on its leadership by actively seeking to leverage its research capability in cross-sectoral, global and equitable partnerships. In so doing, it can procure tangible, long-lasting and shared benefits that provide excellent value for money, address major global challenges and catalyse economic, societal and environmental goods for communities internationally and across the UK.

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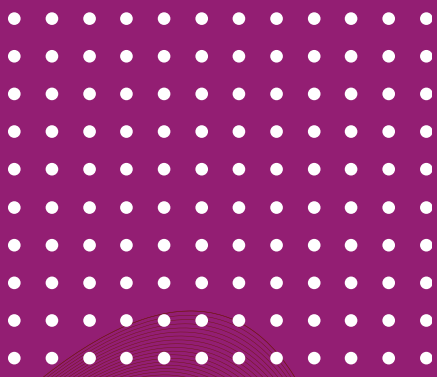
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