



Department for  
Business, Energy  
& Industrial Strategy

# MID-TERM EVALUATION OF THE NEWTON FUND

Newton Fund Evaluation

December 2018



**Coffey International Development in partnership with RSM UK**

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# Acronyms

<b>ADR</b>	Adverse drug reaction
<b>AHRC</b>	Arts and Humanities Research Council
<b>APHH</b>	Atmospheric Pollution & Human Health in a Chinese Megacity
<b>ATT</b>	Anti-tuberculosis treatment
<b>AVN</b>	African Very Long Baseline Interferometry Network
<b>BBSRC</b>	Biotechnology and Biological Sciences Research Council
<b>BEIS</b>	Department for Business, Energy and Industrial Strategy
<b>BIS</b>	Department of Business, Innovation and Skills
<b>BMBF</b>	German Education and Research Ministry
<b>CSSP-China</b>	Climate Science for Service Partnership-China
<b>DARA</b>	Development in Africa with Radio Astronomy
<b>DBT</b>	Department for Biotechnology
<b>DFG</b>	German Research Foundation
<b>DFID</b>	UK Department for International Development
<b>DILI</b>	Drug induced liver injury
<b>DP</b>	Delivery Partner
<b>DRUSSA</b>	Development Research Uptake in Sub-Saharan Africa
<b>EEAG</b>	Expert Evaluation Advisory Group
<b>ENSURE</b>	Enhanced Surveillance for Control and Elimination of Malaria in the Philippines
<b>EPSRC</b>	Engineering and Physical Sciences Research Council
<b>ESRC</b>	Economic and Social Research Council
<b>EQ</b>	Evaluation Question

<b>FDI</b>	Foreign Direct Investment
<b>FWCI</b>	Field Weighted Citation Index
<b>GCRF</b>	Global Challenges Research Fund
<b>GIZ</b>	German Corporation for International Cooperation
<b>GSIAC</b>	Global Science and Innovation Advisory Council
<b>HartRAO</b>	Hartebeesthoek Radio Astronomy Observatory
<b>HEI</b>	Higher Education Institutions
<b>HEP</b>	Higher Education Partnerships Programme
<b>HESN</b>	Higher Education Solutions Network
<b>ICT</b>	In-country team
<b>IHWS</b>	Integrated heterogeneous wireless system
<b>INEW</b>	Indo-UK Centre for Improvement of Nitrogen use Efficiency in Wheat
<b>IP</b>	Intellectual Property
<b>IPR</b>	Intellectual Property Rights
<b>LIF</b>	Leaders in Innovation Fellowship
<b>LIFE</b>	Long Term Incarcerated Patients in Forensic Settings
<b>LMIC</b>	Low or middle income country
<b>LQ</b>	Location quotients
<b>MoU</b>	Memorandum of Understanding
<b>MRC</b>	Medical Research Council
<b>NBF</b>	Newton-Bhabha Fund
<b>NERC</b>	Natural Environment Research Council
<b>ODA</b>	Official Development Assistance
<b>OECD-DAC</b>	Organisation for Economic Co-operation and Development - Development Assistance Committee
<b>PAFiC</b>	Precision Agriculture for Family-farms in China
<b>PCC</b>	Philippine Carabao Centre

<b>PEER</b>	Partnerships in Enhanced Engagement in Research
<b>PI</b>	Principal Investigator
<b>R&amp;D</b>	Research and Development
<b>RAEng</b>	Royal Academy of Engineering
<b>RCUK</b>	Research Councils UK
<b>R&amp;I</b>	Research and Innovation
<b>SASIE</b>	South African PhD Partnering Network for Inclusive Growth through Social Innovation & Entrepreneurship
<b>SDGs</b>	Sustainable Development Goals
<b>S&amp;I</b>	Science and Innovation
<b>SIDA</b>	Swedish Development Agency
<b>SIN</b>	Science and Innovation Network
<b>SKA</b>	Square Kilometre Array 2
<b>STEM</b>	science, technology, engineering and mathematics
<b>STFC</b>	Science & Technology Facilities Council
<b>STI</b>	Science, Technology and Innovation
<b>SuS-MAR</b>	Sustainable Green markets
<b>ToC</b>	Theory of Change
<b>TTO</b>	Technology Transfer Office
<b>UCT</b>	University of Cape Town
<b>UIS</b>	Institute of Statistics
<b>UKIERI</b>	UK India Education Research Initiative
<b>UKRI</b>	UK Research and Innovation
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organisation
<b>UNESP</b>	Universidade Estadual Paulista
<b>VfM</b>	Value for Money

**WEF GCI**

World Economic Forum Global Competitiveness  
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# Executive summary

In 2014, the then Department for Business, Innovation and Skills (BIS)<sup>1</sup> launched the Newton Fund. The Fund fosters science and innovation partnerships that promote the economic development and welfare of partner countries across the globe. The Newton Fund has been active in 18 countries, delivering activities grouped under three ‘Pillars’: capacity building, fellowships and mobility schemes (People Pillar); research collaborations (Research Pillar); and industry-academia partnerships to create collaborative solutions to development challenges and strengthen innovation systems (Translation Pillar). Activities are match funded with contributions from partner countries.

In the 2015 UK Spending Review it was agreed to extend and expand the Fund – providing an additional two years of funding to 2021, with a total planned investment of £735 million as part of the UK’s Official Development Assistance (ODA) Commitment. At the same time, it was decided BIS would be replaced by BEIS (the Department for Business, Energy and Industrial Strategy).

BEIS is the second highest ODA spending department after DfID with a budget of £4.9bn<sup>2</sup>. They use their ODA research and innovation budget to support the Government’s Aid strategy with a focus on global efforts to defeat poverty, tackle instability, and create prosperity in ODA eligible countries. The Newton Fund is an example of BEIS use of ODA funds to build international partnerships to tackle global challenges, whilst at the same time aligning to challenges identified in the Industrial Strategy.

## The Newton Fund in brief

**Delivery partners:** The Fund is delivered by UK ‘delivery partners’. They develop and run calls, and allocate and manage the money they receive as part of the Newton Fund: (\*denotes that from 1st April 2018 organisation is now part of UKRI)

- Academy of Medical Sciences
- British Academy
- Royal Society
- Royal Academy of Engineering
- Innovate UK\*
- UKRI
- Arts and Humanities Research Council\*
- Biotechnology and Biological Sciences Research Council\*
- Economic and Social Research Council\*
- Engineering and Physical Sciences Research Council\*
- Medical Research Council\*
- Natural Environment Research Council\*
- Science & Technology Facilities Council\*
- British Council
- Met Office

<sup>1</sup> At the time of launch the department was known as the Department for Business, Innovation and Skills (BIS) and later became the Department for Business, Energy and Industrial Strategy (BEIS).

<sup>2</sup> Period is from 2016/17 to 2020/21.

**Partner countries:** All partner countries are on the OECD DAC (Development Assistance Committee) list of ODA recipients (\*\*denotes the country is no longer active):

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"><li>• Brazil</li><li>• Chile</li><li>• China</li><li>• Colombia</li><li>• Egypt</li><li>• India</li></ul> | <ul style="list-style-type: none"><li>• Indonesia</li><li>• Jordan</li><li>• Kazakhstan**</li><li>• Kenya</li><li>• Malaysia</li><li>• Mexico</li></ul> | <ul style="list-style-type: none"><li>• Peru</li><li>• Philippines</li><li>• South Africa</li><li>• Thailand</li><li>• Turkey</li><li>• Vietnam</li></ul> |
|---|---|---|

**UK government ownership and management:** BEIS maintains overall oversight of the Newton Fund, and is responsible for its strategy and implementation, governance, and monitoring and evaluation. Within BEIS, Regional Leads are responsible for bilateral partnerships, including Newton Fund countries. The Regional leads play a coordination and supervision role, particularly backstopping the in-country teams. In-country teams are responsible for establishing connections and ensuring support from local funding partners. There are dedicated Newton Fund staff based in all active countries, in some cases there are also representatives of UK delivery partners who liaise with the local partners directly. Operationally, the ODA Research Management Team is responsible for co-ordination of the delivery of BEIS Research ODA funds. Their role encompasses fund-level management, coordination of the UK delivery partners, and financial reporting. They take care of portfolio mapping, evaluation, impacts tracking and analysis, as well as communications and brand development for BEIS ODA funds.

**Types of activities funded:** A variety of activities are funded through the Newton Fund including but not limited to:

- joint research on development topics;
- student and researcher fellowships and mobility schemes;
- challenge funds to develop innovative solutions on topics of interest to developing nations; and
- science and innovation capacity-building.

In August 2015, BEIS appointed Coffey, in partnership with RSM Consulting UK, as the Evaluation provider for the Newton Fund. The Evaluation provider is responsible for independently evaluating the overall effectiveness and impact of the Newton Fund.

### Purpose of the Mid-term Evaluation Report

The mid-term evaluation report follows the baseline research and initial analysis completed in 2016. This evaluation covers the four years of implementation of the Newton Fund to July 2018. The mid-term evaluation provides evidence of the Fund's relevance, effectiveness, additionality, as well as prospects for impact and sustainability. BEIS and the delivery partners can use this evidence to inform the future implementation and management of the Fund to the

end of its current funding in 2021. The report also provides transferable learning for a wider audience including policymakers, other UK government departments, and donor agencies.

## Evaluation Approach and Methods

The Evaluation provider produced the Newton Fund Evaluation Strategy in July 2016 following an initial scoping and analysis phase that included the development of a Theory of Change for the Fund, setting out the expected pathways to impact, and the underlying assumptions on which success is predicated. The Evaluation Strategy was approved by BEIS in consultation with an Expert Evaluation Advisory Group (EEAG) comprising members from DFID, FCO, Treasury, the National Audit Office, and an independent academic advisor. The Evaluation Strategy was also subject to review by DFID's Evaluation Quality Assurance and Learning Services (EQuALS) and received a 'green' rating.

The Evaluation Strategy set out the rationale for a theory-based evaluation approach, using contribution analysis. This approach was guided by a Theory of Change that identified the expected pathways of change, including the role of internal assumptions and external factors. These pathways of change were then tested and documented as part of our approach. The evaluation design brings together the analysis and findings from different quantitative and qualitative, primary and secondary data sources that included analysis of BEIS activity tracker data; an online survey of more than 850 Newton Fund award holders; a telephone survey of more than 200 award holders; a process evaluation involving more than 50 in-depth interviews with staff from BEIS, the UK delivery partners and each of the in-country teams; and a series of thematic impact studies covering eight Newton Fund partner countries (Brazil, China, Egypt, India, Malaysia, Mexico, Philippines, and South Africa) which included a sample of 24 individual Newton Fund awards across all Pillars and encompassing activities of all UK delivery partners.

### *Challenges and Limitations*

The Evaluation Strategy assumed that Fund-level monitoring data would be available for the evaluation period, and the Evaluation provider made a series of recommendations in 2016. One recommendation was for common indicators that monitor outputs and outcomes be added to the internal financial management tool. However, due to the technical limitations of the existing tool, BEIS has had to develop a centralised, semi-automated reporting tool to implement the recommendation. This is still under development meaning that comprehensive, standardised data was not available at this point in the Evaluation<sup>3</sup>. Further, comprehensive beneficiary data was not able to be shared with the Evaluation provider due to data sharing concerns. The above has limited the extent to which quantitative findings on these topics can be presented in this Evaluation report.

The online survey achieved 862 responses from Newton Fund award holders – a response rate of more than 25% from those who received the survey invitation. In the absence of comprehensive data on the overall population of Newton Fund award holders, an assessment of the representativeness of the survey cannot be made.

The country case studies were selected to provide information by Pillar, sector, and delivery partner. With the case study sample drawn from eight countries these cannot be considered truly representative of the Fund's activities across all 18 partner countries. The objective of the

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<sup>3</sup> Some monitoring and evaluation data is collected by delivery partners (for example through Gateway to Research) but this is not yet in a standardised system and does not cover all delivery partners involved in the Newton Fund in a standardised way.

case study selection has been to achieve “coverage”; that is, to identify examples of as many types of collaboration as possible to be able to generalise the lessons learned for the Fund as a whole.

## Approach to analysis and presentation of findings

After conducting the research, the evaluation team analysed and triangulated the findings from different research methods against a series of judgement criteria established in the evaluation framework. In presenting the findings, each of the headline evaluation questions has been assessed against a ‘traffic light’ rating system. This approach is considered appropriate, given the study’s objectives of making judgements of performance without introducing a false sense of quantitative precision given the limitations noted above. In each case the traffic light system is used to assess both the performance of the Newton Fund against the criteria, and the strength of evidence available to the Evaluation to support the conclusions reached. For simplicity, the Executive Summary presents only the rating for the findings (while the strength of evidence rating is presented in the detailed chapters).

## Summary of findings

The available evidence confirms:

- The **relevance** of the Newton Fund, which is delivering activities and outputs consistent with the overall goal of the Fund to promote economic development and welfare in partner countries and reaching its intended target recipients. In addition, UK research, science and innovation also benefits from the Fund - with potential for trade and investment opportunities for UK businesses in the future.
- The **effectiveness** of the Newton Fund, which has already
  - improved the capacity of individuals and institutions to deliver high quality science for example through mobility schemes and student and researcher fellowships (People Pillar)
  - generated new international research collaborations that are delivering research outputs in large numbers through joint research centres and/ or projects tackling development challenges (Research Pillar)
  - created collaborative solutions aimed at tackling development challenges, for example through challenge funds (Translation Pillar).

As such, the Fund is on track to deliver its **intended impacts** – but few are expected to be fully observable within the current funding timeframe. Beyond the current funding timeframe, some networks and relationships may be **sustained** but most collaborative activities depend on funding to continue.

As demonstrated in our Process Evaluation, there is scope to improve processes underpinning the Newton Fund, for example to make explicit what has been implicit and thereby align expectations and bring efficiencies. Nevertheless, the adaptability and flexibility of the Newton Fund has been key to the above successes.

## Main findings

**The Newton Fund is delivering research and collaboration activities and outputs consistent with the overall goal of the Fund in promoting economic development and welfare and is reaching its intended target recipients.**

Rating	Findings
GA	<ul style="list-style-type: none"> <li>The activities supported by the Newton Fund and the outputs delivered to date are consistent with the intended aims of the Fund, the theory of change, and the stated goals of BEIS.</li> <li>The chosen countries of focus are appropriate and are countries where there is an opportunity to collaborate and further science and innovation based on mutual interest of both the UK and the partner countries.</li> <li>Activities are observed to be compliant with ODA eligibility rules.</li> <li>The Newton Fund does not have a formal strategy or statement on expectations regarding how issues of gender equality should be promoted or integrated in the selection, design and delivery of Fund activities.</li> </ul>

The Newton Fund **partner countries are 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.

Newton Fund activities are reaching the intended recipients, predominantly academics and PhD students and researchers, with smaller numbers of private and public-sector recipients. The mix of recipients is appropriate and reflects the three Pillars under which support is provided. Reach is somewhat skewed towards People pillar activities reflecting the emphasis on these in the early years of the Fund, and the larger numbers of recipients that can be reached by individual activities through capacity building events and training.

The case studies showed that **Newton Fund activities fit well within the results framework** established in the 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.

Overall, although **there is no formal strategy for integrating or promoting gender equality in the delivery of Fund activities**, almost 40 per cent of known fund participants to date are female – albeit with significant variation across partner countries. There are examples of Newton Fund projects that are targeting women or gender equality issues in science and innovation such as programmes to attract and retain women in STEM careers in India, and the 'Gender and Education in Rural Areas in Brazil' research project.

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

Rating	Findings
G	<ul style="list-style-type: none"> <li>The Newton Fund is successfully building the capacity of individuals to advance science and innovation in partner countries and in the UK.</li> <li>The Fund has also built institutional capacity in partner countries which has enhanced the management and organisation of international collaborative science.</li> </ul>

There is strong evidence that Newton Fund activities have **successfully built the capacity of individuals and institutions in partner countries and the UK**. Primarily this has been achieved through training; access to UK research infrastructure and technology not available in partner countries; and networking and mentoring opportunities between UK and partner country award holders. The ability of the Fund to **foster and support long-term collaboration** is a strength of the model.

Management and coordination of the Newton Fund within partner countries has posed some challenges for participating institutions. This has led in some cases to investments in dedicated management and administration roles to facilitate the delivery of the Fund, particularly in institutions which had no or limited prior experience of international collaboration. **This has enhanced the capacity of these institutions to manage and administer large funding programmes**, and in some cases is reported to have increased the quality of research outputs.

A critical success factor is ensuring sufficient ‘face time’ and interaction between the collaborators to enable greater knowledge transfer. Follow-up refreshers and opportunities to further develop networks and relationships formed during training activities are a key factor in ensuring lasting benefits and continued collaboration.

The role of the in-country teams is also a crucial factor in enabling institutional capacity building. They facilitate introductions and initial co-operation activities providing valuable knowledge and insight to in-country partners on how to best manage and administer Newton Fund activities. **In-country teams’ context specific knowledge and understanding has been critical in facilitating the creation of new partnerships and collaborations.**

**The Newton Fund has generated new international research collaborations, including joint research centres and projects, that are delivering research outputs in large numbers. The quality of the collaborative research has yet to be evaluated.**

Rating	Findings
G	<ul style="list-style-type: none"> <li>The Newton Fund has successfully supported and enabled international research that has embedded collaboration from conception to delivery.</li> <li>The Fund has facilitated research collaborations of greater scope and scale than would otherwise have been possible and has been successful</li> </ul>

	<p>in generating collaborations that bring together academics and researchers across different disciplines and areas of interest to research global development challenges through a new lens.</p>
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Activities supported by the Newton Fund under the Research Pillar have enabled research collaborations greater than the sum of its parts, by taking advantage of the (high quality) **complementarity capabilities of the UK and partner countries' institutions and individuals**. There is evidence of collaborations which have been successful in drawing on and combining insights from multiple disciplines to create research outcomes that are context specific and which have practical applications to address global development challenges.

Critical success factors are related to the availability of research funding, but also the funding of workshops and events where new collaborations can be codeveloped by individuals and organisations who might not otherwise have met or identified a common interest. **Embedding relation building activities into the delivery of projects is also essential** – to ensure true collaboration and exchange of ideas and knowledge. Again, the role of the in-country teams is crucial in facilitating scoping missions, workshops and ‘match making’ potential researcher and institutional collaborations. Award selection processes seek to ensure that the Newton Fund delivers applied research relevant to global development challenges, but more research is needed to ascertain the extent to which this is achieved in practice.

**Translation activities have created collaborative solutions aimed at tackling development challenges – with some results observed in the early years of the Fund's operation**

Rating	Findings
GA	<ul style="list-style-type: none"> <li>Many Translation activities remain in the early stages of delivery and are not expected to deliver measurable results in the short to medium term.</li> <li>However, there is already evidence of translation outcomes in the form of new start-up companies, licencing agreements and new intellectual property being created. There are also examples of Newton Fund research informing policy changes at national and local levels and capacity building in this field.</li> </ul>

The early years of the Newton Fund focussed on People pillar activities, being those that were relatively faster and easier to launch. Translation projects have required more time to develop and to implement, and as a result there are fewer examples of outcomes to report at this mid-point of the Fund's lifetime. This is consistent with the Theory of Change for the Fund with a shared understanding that **such outcomes (and impacts) will take longer to come to fruition – and some may not be possible to fully observe even within the lifetime of the Fund**. Nevertheless, some outcomes have been observed, that include partnerships with the private sector that have led to the creation of new enterprises and licencing, and activities that have led to policy change at a national or regional level within partner countries.

**Ensuring the transferability of research findings into commercialisation or policymaking is critical to success.** Those projects which have been successful are those which have considered and planned for transferability from the outset, and those which have shared and taken advantage of unique specialisms, facilities or resources of each of the partners in the collaboration. **The added value of the Newton Fund is in creating and supporting these new collaborations which deliver more than the sum of the individual partners could have achieved in isolation.** Challenges remain, often related to government or institutional funding mechanisms and bureaucratic processes which can hinder the progress of translation activities in partner countries.

**The Fund is on track to deliver its intended impacts – but few will be fully observable within its lifetime.**

Rating	Findings
	<ul style="list-style-type: none"> <li>The Newton Fund has strengthened strategic partnerships between the UK and partner countries, particularly in the areas of science and innovation, but also beyond this by opening doors for collaboration and dialogue on other issues.</li> <li>It is too early to assess whether the Newton Fund has delivered on higher-level impacts. These will take many years to come to fruition and may not be fully observable within the lifetime of the Fund.</li> </ul>

The Newton Fund has provided a platform for the **development and strengthening of strategic partnerships at government level**. The requirement for match funding has been a useful lever to ensure partner country engagement and commitment to jointly seek to tackle global development challenges through science and innovation.

**It is too early for evidence of Fund-level impacts to be visible to any great extent.**

However, where data exists, it confirms that Newton Fund activities are well-placed to contribute to the long-term objectives of the Fund in terms of addressing global development challenges. Evidence gathered through case studies and the surveys indicates that there is a demonstrable link between project activity and addressing development challenges and improving welfare in partner countries (and globally).

**Networks and relationships may continue – but most collaborative activities are funding dependent**

Rating	Findings
	<ul style="list-style-type: none"> <li>There is evidence that the relationships and partnerships that the Newton Fund has supported will be sustainable over time, but further measures could be taken to ensure mechanisms for sustained contact and engagement between recipients are established.</li> <li>However, at Fund level there is no sustainability or exit strategy in place (given that funding ends in 2021). This has already posed some challenges where partner countries graduate from the DAC list, and</li> </ul>

	partner country delivery partners and governments are concerned about the potential for long-term collaboration given the time limited nature of the Newton Fund.
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Without additional funding from the Newton Fund it is unlikely that many capacity building and research activities will continue beyond the immediate short term. Such projects are reliant on funded programmes implemented by delivery partners who will not continue to implement activities without funding. However, there is potential for sustaining some of the networks and collaborations that have been facilitated through the Newton Fund, and the capacity building provided through the Fund will enable participants to better engage in collaborative work in the future. Whilst it is too early to draw firm conclusions, **there is emerging evidence of sustainable results in terms of commercialisation of research and in influencing policymaking that may continue to generate benefits beyond the lifetime of the Fund.**

**UK research, science and innovation also benefits from the Fund – with potential for trade and investment opportunities for UK businesses in the future**

Rating	Findings
G	<ul style="list-style-type: none"> <li>• UK science and innovation has also benefitted from enhanced relationships and collaborations with new partners across the portfolio of Newton Fund partner countries – enabling access to knowledge, resources and skills not available in the UK.</li> <li>• As well as benefits to academia, there are emerging examples of commercial opportunities for UK businesses arising from applied research undertaken funded by the Newton Fund. It is too early to fully quantify such benefits.</li> <li>• The scale of the Newton Fund and its distinctive model based on collaboration and mutual interest with partner country objectives distinguishes it from other funders and is establishing the UK as the ‘partner of choice’ for science and innovation cooperation in some countries.</li> </ul>

**There is scope to improve processes underpinning the Newton Fund**

Rating	Findings
GA	<ul style="list-style-type: none"> <li>• A one-size-fits-all approach to processes, while much simpler to deliver, would not be appropriate for the Newton Fund. Flexibility and adaptability have been key to success so far. Nevertheless, the process evaluation found that there are benefits to be realised from making explicit what has been implicit, such as formalising expectations both in terms of the Fund itself and of the different actors involved.</li> </ul>

## Recommendations

Based on the findings of the mid-term evaluation we make the following recommendations:

- **Recommendation 1:** The Newton Fund does not have a formal strategy or statement on expectations regarding how issues of gender equality should be promoted or integrated in the selection, design and delivery of Fund activities. There are examples of Newton Fund projects targeting women or gender equality issues in science and innovation. These should be critically assessed against the DAC gender equality policy marker. Further, a thematic review of how gender is being incorporated into programming at present and guidelines as to how to improve approaches to gender equality within the Fund (and how to measure them) is recommended. Context specific issues should be considered as part of the development of updated country strategies for Newton Fund partner countries.
- **Recommendation 2:** To ensure the success and sustainability of capacity building within the Newton Fund, additional emphasis should be placed on the development and support of professional networking and virtual meeting opportunities to ensure continued peer learning and knowledge exchange, and to continue to foster new partnerships and collaborations among Newton Fund alumni.
- **Recommendation 3:** In assessing future proposals for activity for the Newton Fund, delivery partners should include an assessment of the collaborative value of each proposal they receive to ensure: the proposed sequencing of research between the participating research teams, the plans in place to ensure collaborative (as opposed to parallel) working, and a risk assessment to consider mitigation strategies regarding potential delays in securing funding and research permissions on each side of the partnership and the impact on collaboration. Delivery partners should also make clear how the collaborative value of projects will be ensured when they put in proposals to BEIS.
- **Recommendation 4:** BEIS should work with delivery partners to develop a more structured approach to enable the application of research outcomes into policymaking or commercialisation. For instance, provide opportunities for “catalyst funds” for Newton Fund recipients to bid for follow-on support directly linked to Fund research outcomes.
- **Recommendation 5:** With the level of funding not confirmed beyond 2021, it is an appropriate time for BEIS and UK delivery partners to discuss plans for ensuring the sustainability of Newton Fund results (including the collaborations and networks already established). This should include a strategy for engagement beyond 2021 for the different countries, which considers the implications for the work of delivery partners, as well as the impact of a loss of engagement between the UK and partner countries given the political importance of the Fund in many partner country governments and institutions. Clear objectives need to be set at Board level for the exit of the Fund from all countries (or for transitioning of support via new partnerships or assistance) to ensure continuity in the benefits to the UK and partner countries.
- **Recommendation 6:** Concerted action is needed to gather consistent and comprehensive monitoring data on Newton Fund award holders, and the outputs and outcomes generated. This should include a requirement for delivery partners to provide regular reporting on award-level activities and outputs, and to share data on the award

holders supported by the Fund as a condition of their funding agreements. The collection of these data is important as these will form part of the evidence base to demonstrate accountability.

- **Recommendation 7:** Linked to this, there is a need to review the Evaluation Terms of Reference to consider how to reflect the expanded scale and scope of the Fund in the final evaluation, as well as reflect on the lessons learned from the mid-term evaluation and the challenges encountered.
- **Recommendation 8:** This mid-term evaluation will be the only evaluative evidence of the progress and achievements of the Newton Fund to take place prior to the final evaluation scheduled in 2021. It is recommended that BEIS consider undertaking additional evaluation activities during the intervening period to ensure a flow of evidence can be provided to BEIS, the Board and other interested parties. We suggest that this could take the form of deep dive studies on areas of interest or concern (such as issues of gender mainstreaming, quality of research and others identified within this report).

**A management response to the recommendations of the Mid-term Evaluation (and the separate recommendations of the July 2018 Process Evaluation) is advised.**

# 1. Introduction

## 1.1 Purpose of this report

In August 2015, Coffey International Development Ltd (“Coffey”) and RSM-PACEC were selected by the (then) Department of Business, Innovation and Skills (BIS) to undertake a longitudinal evaluation of the Newton Fund.

The Newton Fund is a £735m, seven-year programme supported by the (now) Department of Business, Energy and Industrial Strategy (BEIS) as part of the UK’s Official Development Assistance (ODA) Commitment. The Newton Fund fosters science and innovation partnerships that promote the economic development and welfare of partner countries and is now active in 17 countries. The Fund delivers three types of activities: capacity building, fellowships and mobility schemes (People Pillar); research collaborations (Research Pillar); and industry-academia partnerships to develop innovative solutions to development issues (Translation Pillar).

This report presents findings from the Mid-term Evaluation of the Newton Fund. The report provides evidence on the relevance, effectiveness, additionality, and emerging impact of the Newton Fund. It also provides evidence and recommendations on Newton Fund processes, areas for improvement, as well as prospects for sustainability.

The direct recipient of this report is BEIS, but its findings will also be useful for other stakeholders working on the Newton Fund, including but not limited to the UK delivery partners, partner country delivery partners, in-country teams, funding agencies, research institutions, non-participant countries and other stakeholders in the science and innovation field.

### 1.1.1 Report structure

The remainder of the report is structured as follows:

- **Chapter 2** provides the context to the Newton Fund, including the UK policy background, the Newton Fund structure, Theory of Change, a summary of baseline findings and evolution of the Newton Fund to date;
- **Chapter 3** outlines the methods employed in the Mid-term Evaluation, the data sources and the limitations in our approach;
- **Chapter 4** discusses Fund-level evidence related to the relevance and appropriateness of Newton Fund activities;
- **Chapter 5** provides evidence on the effectiveness of capacity-building activities;
- **Chapter 6** presents evidence on the effectiveness of collaborative research activities;
- **Chapter 7** provides evidence on the effectiveness of Translation pillar activities;
- **Chapter 8** builds on the process evaluation to look for further Fund-level evidence on what is working well and what could be improved in terms of systems and processes;

- **Chapter 9** discusses the potential for long-term impact arising from the Newton Fund, and issues related to sustainability;
- **Chapter 10** discusses evidence on the results observed to date in development strategic partnerships; and
- **Chapter 11** presents our overarching conclusions and recommendations.

**Annexes** provide the evaluation framework, and a more detailed statement of the evaluation methodology. Reports of eight country case studies and the process evaluation conducted by the evaluation team are contained in a separate standalone annex to the report. Relevant findings are incorporated into the body of this report.

## 1.2 Evaluation approach

The Mid-term Evaluation covers implementation of the Newton Fund to date (2014 – 2018) and assesses the effectiveness and results of activities in partner countries, as well as the additionality of Newton Fund supported activities. The evaluation is forward-looking, so that the learning produced is relevant to the future development and implementation of the Fund. Data collection and analysis for the Mid-term Evaluation took place in the second half of 2017 and the first half of 2018.

We used mixed methods to investigate Fund-level relevance, effectiveness, sustainability and signs of emerging impact. The Mid-term Evaluation of the Newton Fund is based on the following sources: a process evaluation, case studies of 24 funded activities across eight partner countries, an online survey with Newton Fund award-holders in all countries, and a telephone survey with online survey respondents who agreed to provide additional feedback on their participation in Newton Fund activities. We triangulated findings from these sources to carry out a comprehensive analysis of Fund-level activities and results to date. The evaluation approach is outlined in detail in **Chapter 3** of this report (with further details provided in the annex).

## 1.3 The mid-term report in the wider evaluation context

The overall aims of the evaluation of the Newton Fund are to establish whether the goal of the Fund – to develop science and innovation partnerships that promote economic development and welfare in partner countries – is being delivered; and whether it is being delivered in a way that represents value for money (VfM). The evaluation also explores secondary benefits of the Fund to the UK – including opportunities for collaboration and trade.

The sequencing of evaluation activities for the Newton Fund has been organised as follows:

- **Phase 1 – Inception:** Short inception phase (September and October 2015) to establish the scope (and budget) of the programme evaluation, for approval by the (then) Newton Fund Board.
- **Phase 2 – Initial Analysis:** Familiarisation phase (November 2015 to March 2016) with the objective of tailoring the evaluation strategy and gathering information to establish a baseline for the Newton Fund based on secondary sources.

- **Phase 3 – Mid-term Evaluation:** Primary research phase (April 2017 to July 2018) including data collection for the process evaluation, and contribution analysis using findings from thematic impact studies, online and telephone surveys.

A **Final Evaluation** is planned to take place during 2019/20.

Within this phased approach, the Mid-term Evaluation provides evidence on the results of the Fund after four years of operation. It provides lessons learned on its relevance, effectiveness, additionality, and processes, as well as prospects for sustainability, and can help inform Newton Fund implementation ahead of the Final Evaluation.

## 2. Context

### 2.1 Introduction

The Newton Fund was conceived in 2014 as a £375m, 5-year programme targeting 15 countries supported by what was then the Department for Business, Innovation and Skills (BIS). In late 2016, the UK government committed to extending the fund, which will now run until 2021 and includes 18 countries, with an increased total budget of £735m. In the same year BIS became “BEIS”, the Department for Business, Energy, and Industrial Strategy. The Newton Fund is part of the UK’s Official Development Assistance (ODA) commitment.

### 2.2 Policy background

#### 2.2.1 Opportunities to engage in science and innovation with emerging powers

The original business case which led to the establishment of the Newton Fund was the 2013 ‘*Emerging Powers Opportunities Fund*’ paper. It outlined how the need for the UK to react to the changing international science and innovation landscape. It stated that although emerging powers are increasingly global players, established networks between these countries and the UK are not as strong as they could be. For a number of reasons (information failures, co-ordination failures, risks and uncertainties) these networks were deemed unlikely to materialise organically. Therefore, to ensure the UK is positioned to properly exploit new opportunities for collaborations, government intervention is a necessary first step. Indeed, missed opportunities for collaboration were attributed (in part) to the lack of structured funding. Based on this rationale, those “emerging powers” with the potential for scientific excellence were to be targeted for partnerships.

As the Fund evolved, much greater emphasis was placed on the benefits of collaboration to the partner countries, ultimately resulting in the agreed **goal of the Fund to promote the economic development and welfare of the partner countries**. This shift in emphasis was agreed by the Board in late 2014, with the **benefits to the UK now presented as secondary benefits of the Fund**. Whilst the original business case outlined a series of market failures hindering the development of science and research collaborations, no detailed Theory of Change was articulated at that time.

#### 2.2.2 Aim of the Newton Fund<sup>4</sup>

The overarching goal of the Newton Fund is to promote the economic development and welfare of either the partner countries or, through working with the partner country, to address the well-being of communities. It will do so through strengthening partner country science and innovation capacity and unlocking further funding to support this work.

<sup>4</sup> Newton Fund official website <http://www.newtonfund.ac.uk/about/>

To achieve this aim, the Fund delivers three types of activity under three ‘Pillars’:

- **People Pillar:** Capacity-building in science and innovation, individually and institutionally in partner countries;
- **Research Pillar:** Research collaborations on development topics; and
- **Translation Pillar:** Creating collaborative solutions to development challenges and strengthening innovation systems.

Covering 18 countries, the Fund is designed to **address a funding gap owing to the perceived risk and potential returns on innovative research projects for businesses, academics and investors**. If the overarching goal is to be achieved, the relationships formed must last beyond the lifetime of the Fund itself – with the aim being that they will ultimately lead to systemic improvement in science and innovation capacity in partner countries in the longer term.

The Fund has a **secondary objective to secure benefits to the UK** – this will be achieved by presenting further research opportunities for the UK science base, improving the skills and activity of UK innovators and researchers, and unlocking opportunities for trade. With some countries becoming ever more important players in the global science, research and innovation sphere, networks between these countries and the UK are becoming more valuable and insufficient networks and platforms for collaboration are a lost opportunity.

### 2.2.3 A distinct funding stream with a focus on mutual interest between partners

**The Newton Fund is distinct among international development programmes.** The Fund supports a complex chain of research and translation mechanisms at multiple levels, designed to improve public policy and economic development indicators in a wide range of low and middle-income countries (LMICs). The main **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. The level of partner country involvement will typically include the joint agreement of funding priorities within each country, meaning that the Fund targets mutual interests, which differentiates it from traditional bilateral development assistance.

Other recent or existing programmes share common research and development mechanisms and are motivated by similar policy goals. Examples include:

- **USAID** funds several programmes to build research capability and reduce poverty around the world. For example, the Higher Education Solutions Network (HESN) supports development labs for researchers to catalyse and scale new science and tech-based solutions to development problems; and the \$28m Partnerships in Enhanced Engagement in Research (PEER) programme partnering LMIC scientists' partner with U.S. researchers to address development issues. USAID innovation funds operate in most of the Newton Fund's active countries.
- The **European Union** supports a variety of international research activities as part of its €80bn Horizon 2020 endowment. The programme has a particular emphasis on collaborations including researchers in developing countries. One of the largest is the Dragon Star – Horizon 2020 programme, which provides €28m in funding for research activities to support collaboration in innovation between the EU and China.

- Individual European countries have also supported this type of initiative. Sweden's development agency (Sida) has funded research capacity development programmes, such as the Innovations Against Poverty Programme, which allocated 83m SEK (£6.75m) to applicants from sub-Saharan Africa, Egypt and India working on translation projects. The German Corporation for International Cooperation (GIZ) promotes science and technology development in ASEAN countries, as well as large industry-academia programmes in China and India through the German Education and Research Ministry (BMBF) and German Research Foundation (DFG).
- In late 2015 the UK government established the £1.5 billion **Global Challenges Research Fund (GCRF)** to support research that addresses some of the challenges faced by developing countries. The GCRF supports action promoting: equitable access to sustainable development, sustainable economies and societies, and human rights, good governance and social justice. GCRF shares many of the Newton Fund delivery partners, are both managed by BEIS. However, the funds differ in their size and scope (the GCRF is much larger) and the GCRF lacks the distinctive features of the Newton Fund, most notably the requirement for matched funding from partner countries. **Whilst the Newton Fund focusses on building partnerships to support research and innovation capacity in partner countries, the GCRF focusses on using the UK's research and innovation strengths to find solutions to global challenges.**

### 1.3 Newton Fund structure

The organisational structure of the Newton Fund is shown in *Figure 1*. Strategic oversight of the Fund is the responsibility of the **BEIS Research and Innovation ODA Board**, chaired by the Minister for Science. The Board convenes every two months and receives quarterly reports from the ODA Research Management Team and BEIS. A **Portfolio and Operational Management Board** (with senior representation from the Delivery Partners, DFID and BEIS) meets on a quarterly basis.

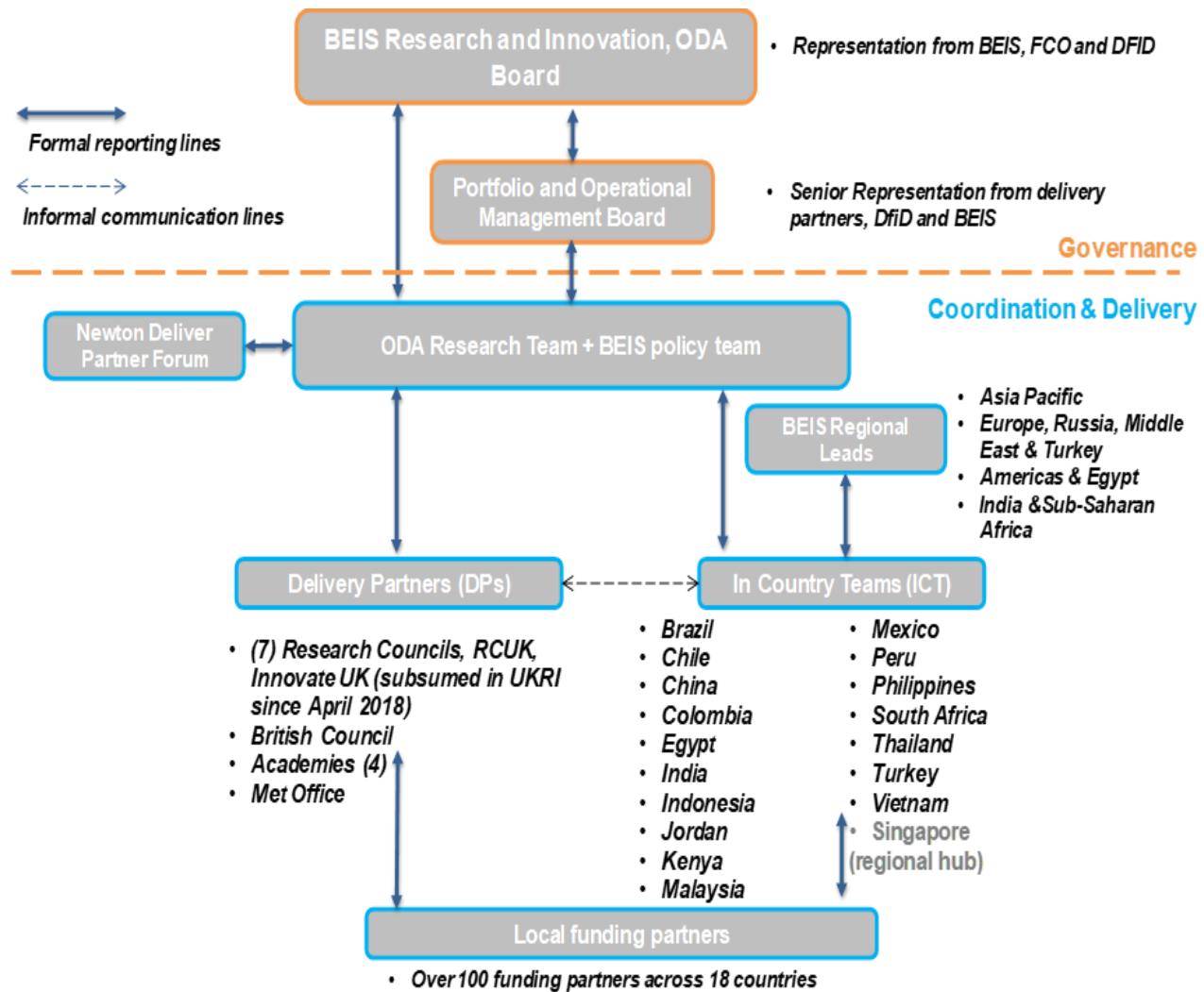
The strategic development, contracts and finance of the Newton Fund are the responsibility of the International Knowledge and Innovation Directorate of BEIS. At the operational level, the **ODA Research Management Team** (ODARMT) keeps track of spending and monitors and supports UK delivery partner activities (for both Newton Fund and the GCRF). The ODA Research Management Team liaises with the **UK Delivery Partners** (DPs) to determine their funding allocations (from the available annual budget) and the scope of their delivery commitments.

The DPs, together with the Newton Fund **In-Country Teams** (ICTs) are responsible for establishing connections and ensuring support from **local funding partners**. In many cases there are dedicated Newton Fund staff based in country (often in UK embassies), whilst in others the ICT function is performed by representatives of UK delivery partners. Activities in South East Asia are supported by a central hub based in Singapore<sup>5</sup>. These are supported by the **BEIS Regional Leads**.

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<sup>5</sup> The Singapore regional hub has a coordinating function for the Newton Fund in South East Asia. SIN is regularly working with a total of 10 countries in the area, five of which are Newton partner countries (Philippines, Vietnam, Malaysia, Thailand, and Indonesia). In practice, the role of the hub is about dealing with staffing/recruitment for the Newton Fund, coordinating and providing regional management in the same time zone, and branding the Newton Fund in a central location.

**Figure 1: Summary of reporting and communication lines for Newton Fund (as at July 2018)**



### 2.3.1 Partner countries

Countries targeted for collaboration as part of the Newton Fund were selected on the basis of a number of criteria:

- being identified under the Foreign Office Emerging Powers Initiative<sup>6</sup> as countries with whom the UK should be increasing its efforts to engage;
- being on the Development Assistance Committee (DAC) list of Overseas Development Aid recipients; and
- having demonstrated a strong appetite to work with the UK to increase their ability to use research and innovation for economic and social goals.

The 18 partner countries are as follows (\*denotes country no longer active):

<sup>6</sup> The Initiative was established in May 2010 to co-ordinate a cross-government strategy aimed at creating much deeper relationships with emerging powers, in pursuit of UK security and prosperity objectives.

- Brazil
- Chile
- China
- Colombia
- Egypt
- India
- Indonesia
- Jordan
- Kazakhstan\*
- Kenya
- Malaysia
- Mexico
- Peru
- Philippines
- South Africa
- Thailand
- Turkey
- Vietnam

These encompass the original 15 partners along with Kenya, Jordan, and Peru, who joined the Fund in 2017. Kazakhstan is currently inactive, though still an official partner country. All partner countries are on the OECD DAC (Development Assistance Committee) list of ODA recipients. Chile's graduation from the DAC list in 2018 prompted strategic thinking and the development of a "bespoke" exit strategy in 2016. The preferred approach was to follow a "bespoke graduation strategy".

### 2.3.2 UK Delivery Partners

There are 15 UK Delivery Partners (\*\*denotes partner is part of UKRI):

- Academy of Medical Sciences (AMS)
- British Academy
- British Council
- Met Office
- Royal Academy of Engineering (RAEng)
- Royal Society
- UK Research and Innovation (UKRI)<sup>7</sup>
- Innovate UK\*\*
- Arts and Humanities Research Council (AHRC)\*\*
- Biotechnology and Biological Sciences Research Council (BBSRC)\*\*
- Economic and Social Research Council (ESRC)\*\*
- Engineering and Physical Sciences Research Council (EPSRC)\*
- Medical Research Council (MRC)\*\*
- Natural Environment Research Council (NERC)\*\*
- Science & Technology Facilities Council (STFC)\*\*

Not all partners are active in all countries. Brazil, China and India have activities funded by all of the participating delivery partners, and all delivery partners except for the Academy of Medical Sciences operate in Malaysia. Country coverage provided by delivery partners (as of July 2018) is shown below.

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<sup>7</sup> Established in April 2018 and superseding the previous Research Council umbrella organisation RCUK, UK Research and Innovation (UKRI) brings together the seven Research Councils, Innovate UK and a new organisation, Research England.

**Table 1: Delivery partners operating in each country**

	Academy of Medical Sciences	AHRC	BBSRC	British Academy	British Council	EPSRC	ESRC	Innovate UK	Met Office	MRC	NERC	RCUK <sup>8</sup>	Royal Academy of Engineering	Royal Society	STFC
Brazil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chile			✓		✓	✓	✓	✓		✓	✓	✓	✓		✓
China	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colombia			✓		✓		✓	✓			✓	✓	✓		✓
Egypt		✓		✓	✓			✓				✓	✓		

<sup>8</sup> No longer active, see explanation in previous footnote  
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India	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indonesia					✓			✓	✓	✓	✓	✓	✓	✓		✓
Jordan		✓										✓	✓			✓
Kazakhstan					✓								✓			
Kenya			✓		✓					✓		✓	✓			
Malaysia		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mexico	✓		✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓
Peru					✓					✓	✓	✓				
Philippines			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			
SE Asia										✓		✓				
South Africa	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thailand			✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓

## Mid-term Evaluation of the Newton Fund

Turkey	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Vietnam			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	

### 2.3.3 In-country teams (ICTs)

ICTs perform a variety of roles depending on the context of the host country and the extent of pre-existing networks and relationships. The precise roles and responsibilities vary by country, reflecting a number of factors such as the pre-existing innovation infrastructure and networks in country; the existing presence of Delivery Partners in country; and the nature of the team put in place (some being based within Embassies, others led by Delivery Partners). The day-to-day tasks of delivery teams vary accordingly but broadly covers programme coordination; stakeholder management; communication and promotion of the Newton Fund; and developing networks and deepening the ‘reach’ of UK science and innovation among universities, government, private sector and other stakeholders. ICTs role is often described as a ‘bridge’ between BEIS and DPs in UK and the Newton partner countries. This can include negotiating the partnerships but also identifying possible opportunities and synergies.

## 2.4 Theory of change

While the original business case outlined a series of market failures hindering the development of science and research collaborations, **no detailed intervention logic was available to reflect the focus of the Fund at the time the evaluation was commissioned.**

The Theory of Change is critical to the design of the evaluation as it maps the causal chain of events (and assumptions) underpinning the Fund providing a framework for the assessment of progress and achievements with respect to planned results and how these are intended to be achieved.

The Theory of Change was developed during the Initial Analysis Phase which ensured that the evaluation team had a comprehensive understanding of who is involved in the Newton Fund, *what types of change* the Fund is aiming to achieve and under *what contextual circumstances*. The Theory of Change (*Figure 2*) explains the different stages of logic and different outputs, outcomes and impacts that the Fund is seeking to achieve. The diagram includes sub-theories of change for each of the Pillars of activities. **These Pillars are not entirely separate, but rather work simultaneously and synergies are expected between Pillars.**

### People Pillar

Activities under the People Pillar are focused on developing human capital to create the appropriate skills and competencies to enable further partnerships to be established between the UK and partner countries. Four distinct types of activities were identified during the Theory of Change development process:

- STEM education support and technical training;
- Placement schemes in UK institutions and partner institutions, such as the Newton International Fellowship Scheme, Newton Mobility Grants and Researcher Links Travel Grants etc.;
- Higher education and research institutions in partner countries linked with the UK; access to facilities, funding, equipment and networks, such as Researcher Links; and
- Professional development and skills training for students, researchers and managers, such as Professional Development and Institutional Skills Development.

## Research Pillar

The aim of this Pillar is to identify and address specific challenges faced in the partner countries, or in other parts of the world **where UK–partner country collaborative research can make a difference on a regional or global scale**. Activities under this Pillar are expected to generate new knowledge and possible solutions to these local, regional and global challenges. Three different approaches to activity under the Research Pillar have been identified:

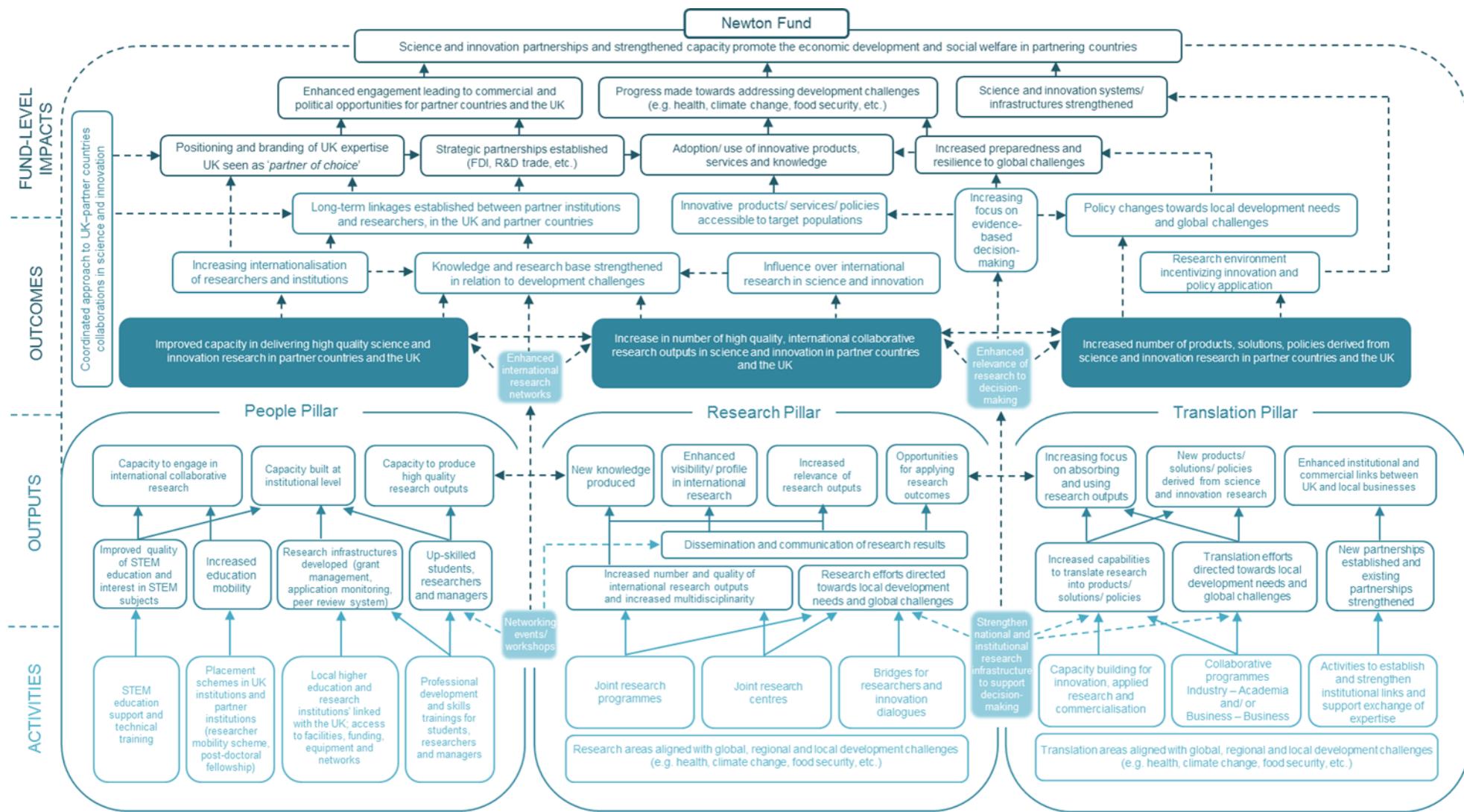
- Joint research programmes, such as Rice Research Initiative, Marine Development Feasibility studies and Earthquakes without Frontiers;
- Joint research centres, such as the UK-China Joint Centre on Probiotic Bacteria or the Centre for Research on Avian Diseases; and
- Bridges for researchers and innovation dialogues.

## Translation Pillar

The aim of the Translation Pillar is to support and bring together the local expertise of researchers in partner countries and in the UK through the development of collaborations between academia, industry and businesses **to ensure that innovative research has a route to the policy arena or the market (via commercialisation)**. The types of activities under the Translation Pillar have been organised into three categories:

- Capacity building for innovation, applied research and commercialisation, such as the Leaders in Innovation Fellowships Programme;
- Collaborative programmes, Industry–Academia and Business–Business, such as the Higher Education Partnerships Programme (HEP), Collaborative Industrial R&D and Institutional Links; and
- Activities to establish and strengthen institutional links and support exchange of expertise, such as Institutional partnerships.

**Figure 2: Newton Fund Theory of Change**



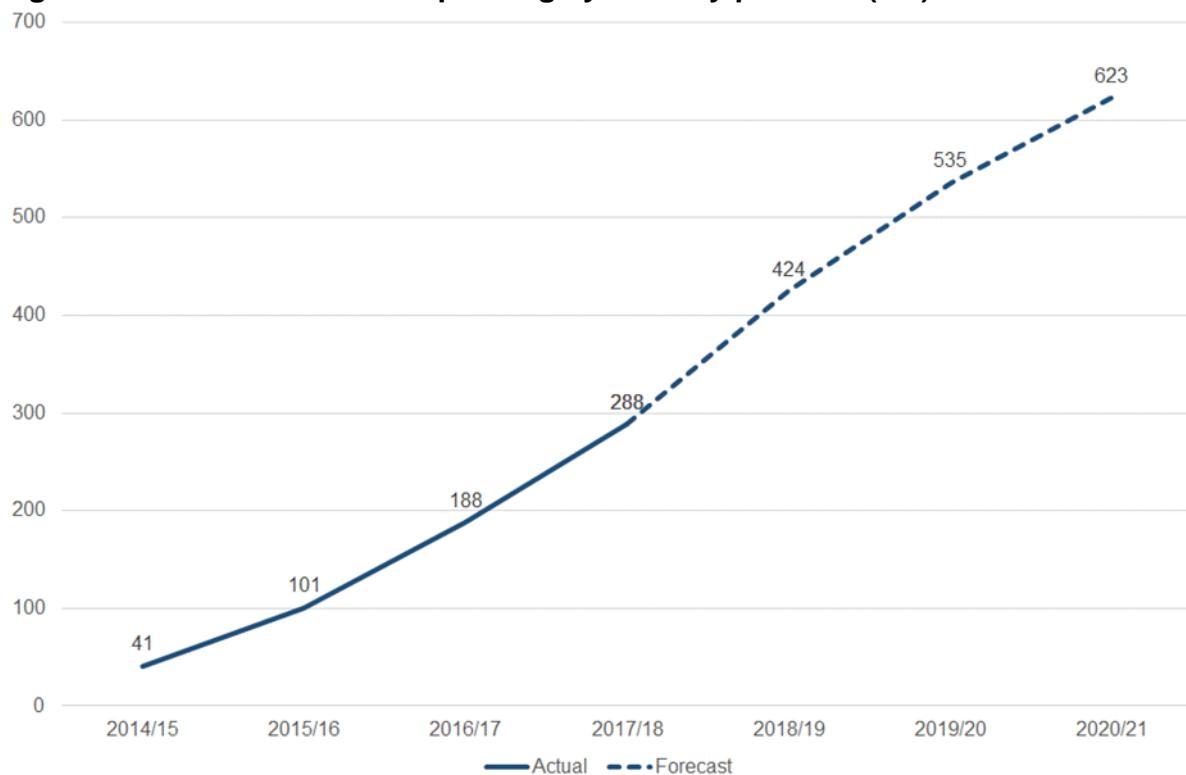
## 2.5 Expenditure to date and forecast

This section provides an overview of Newton Fund cash spend since its 2014 launch, including summaries of funding by country, delivery partner and sector. The data is sourced from the Newton Fund activity tracker of May 2018, capturing actual spend up to and including the 2017/18 financial year.

### 2.5.1 Newton Fund spending at a glance

Total spend up to and including the financial year 2017/18 has been £288m, with a further £335m forecast to be spent by 2020/21 (shown in *Figure 3*). Some funds remain unallocated.

**Figure 3: Cumulative annual spending by delivery partners (£m)**



Note: Based on actuals recorded to the end of 2017/18 and forecasts from the start of 2018/19. The figures were accurate as of the May 2018 version of the Newton Fund activity tracker and are subject to final adjustments. The figures only include spending by the delivery partners and exclude core costs and funds allocated to projects that were indicated to have been dropped from the Fund.

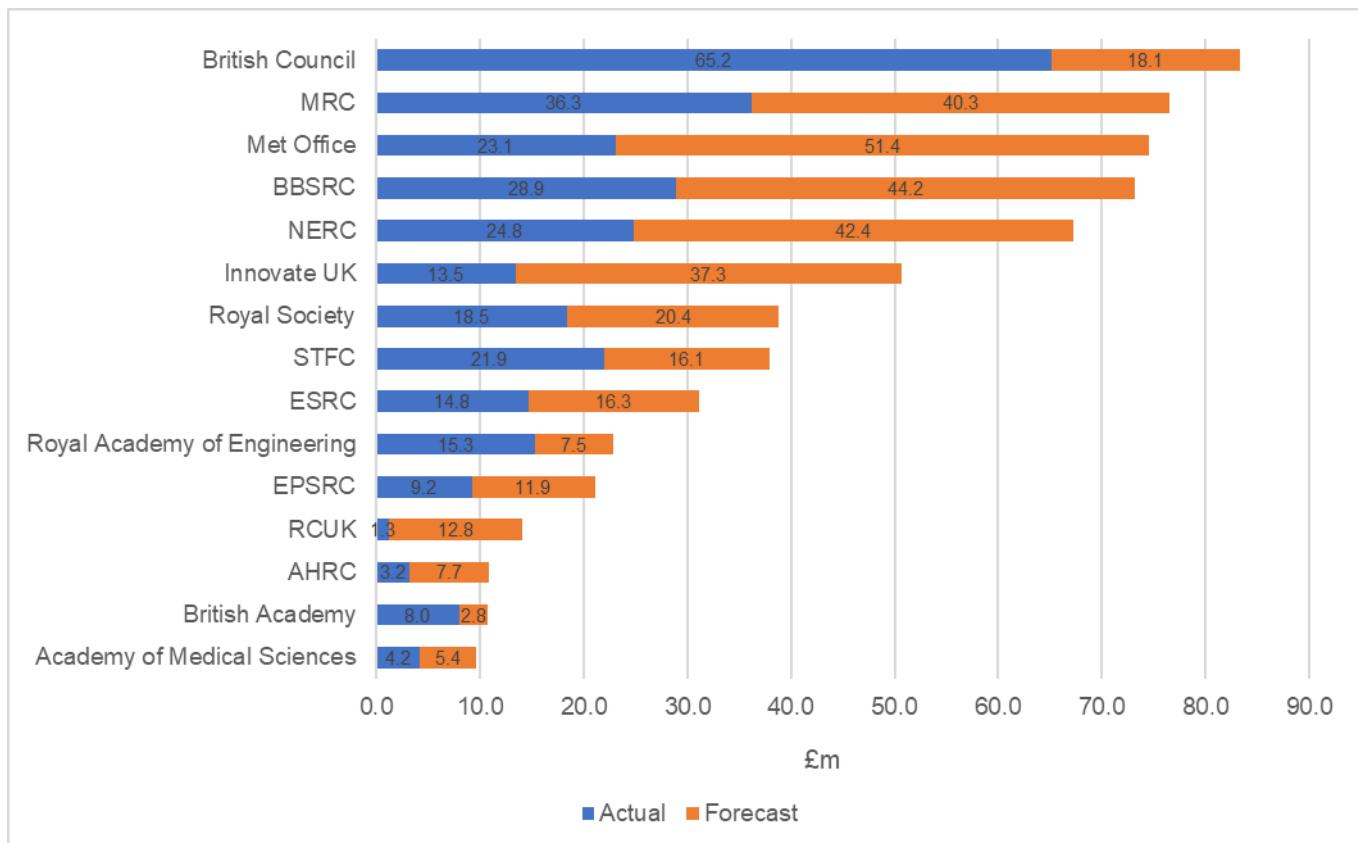
### 2.5.2 Funding by delivery partners

Spend varies significantly between delivery partners. The British Council has been the delivery partner that has spent the greatest amount of funding to date<sup>9</sup> at £65.2m, followed by the MRC with £36.3m and BBSRC with £28.9m. However, the Met Office is projected to take over BBSRC to become the third largest spender over the lifetime of the Fund (*Figure 4*). Spend by

<sup>9</sup> As of May 2018.

other partners is forecast to ramp up over the coming years (while that of the British Council reduces in comparison to other partners). This reflects in part the emphasis of the British Council on People pillar activities and the longer gestation period of some translation projects that will be coming forward from the likes of the Met Office, Innovate UK as well as several research councils and the Royal Academy of Engineering.

**Figure 4: Activity spending by delivery partner (actual to 2017/18; forecast from 2018/19) (£m)**



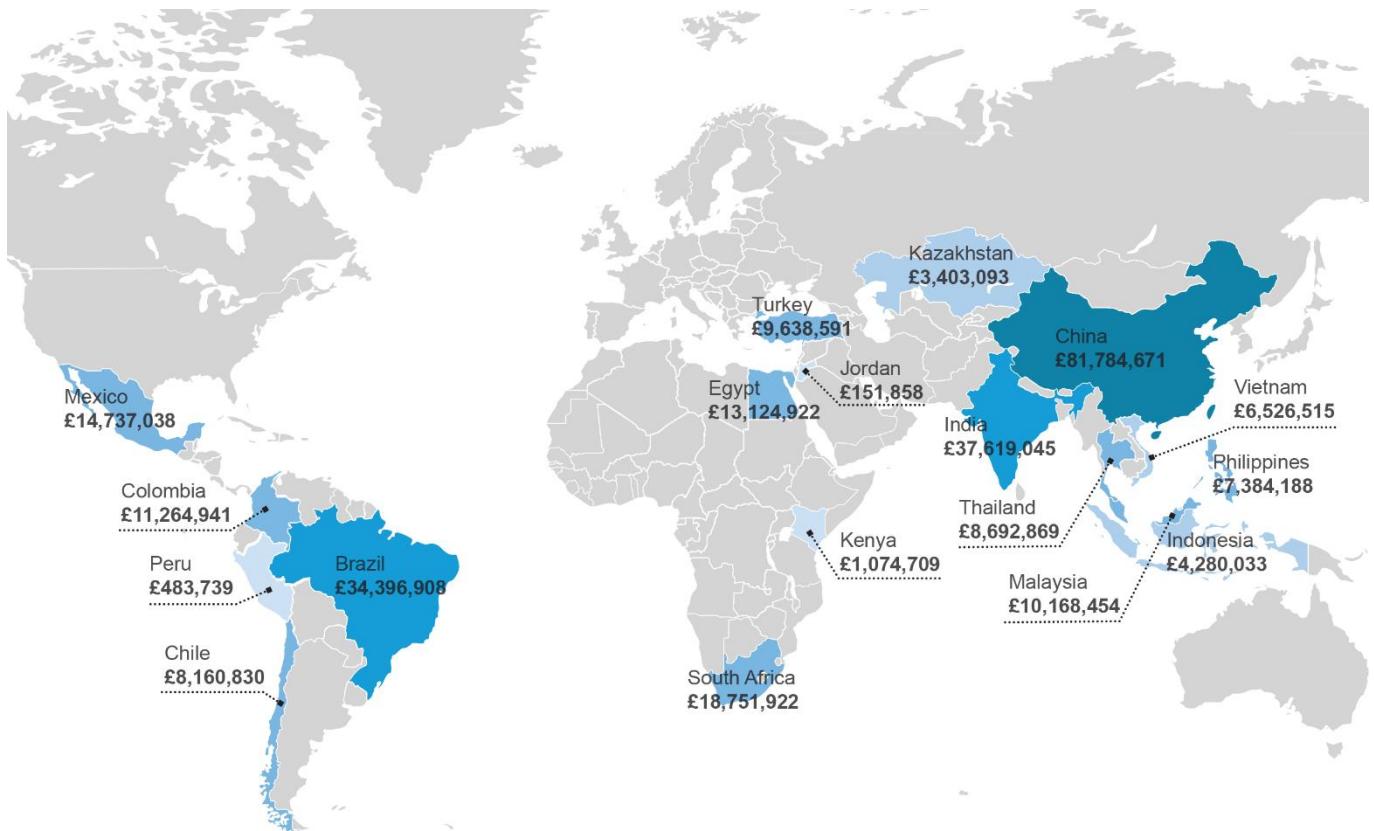
Note: Based on actuals recorded to the end of 2017/18 and forecasts from the start of 2018/19. The figures were accurate as of the May 2018 version of the Newton Fund activity tracker and are subject to final adjustments. Spending shown excludes funds allocated to 'Delivery' and 'Monitoring' not associated with an individual delivery partner. Funds allocated to projects that were indicated to have been dropped from the Fund are also excluded.

### 2.5.3 Funding by partner country

China is forecast to receive by far the largest amount of funding overall; some £82m has been spent in China to date representing 28% of all expenditure. To date, China has received more than twice the amount of the next largest recipients, India at £38m and Brazil at £34m. These three countries are forecast to remain the recipients of the largest volume of Newton funding, collectively representing 54% of actual and forecast spend overall. Kenya, Jordan and Peru currently receive the lowest amounts of funding, in part reflecting their late addition to the Fund's portfolio in 2017 (see *Figure 5*).

In almost all countries, forecast spend is anticipated to be significantly higher than that spent to date, in some cases by several orders of magnitude: spend in India is forecast to almost double during the remainder of the Fund, while Kenya will receive more than double the amount spent to date, and Indonesia almost four times the current spend.

**Figure 5: Funding distribution by country (actuals up to end 2017/18)**



Note: Based on actuals recorded to the end of 2017/18. The figures were accurate as of the May 2018 version of the Newton Fund activity tracker. An additional £2.6m has been spent on the South Asia Hub which is not shown in the map as it is not specific to one country. The map also excludes spend marked as 'regional' or 'unspecified', and monitoring costs where they were not associated with a single country.

## 2.6 Pillar and sector activity

### 2.6.1 Spend by pillar

Although the distinction between the three pillars is somewhat blurred, each activity is marked on the activity tracker as belonging to a single pillar. Most Newton funding (actual and forecast) will be dedicated to Research activities (51% in total, compared to 30% for Translation and 19% for People pillar activities). Reflecting implementation to date and an early emphasis on the People pillar, total spend to 2017/18 was slightly more skewed towards the People pillar (26%), with 27% on Translation and 47% on Research.

**Figure 6: Expenditure by pillar (actual to 2017/18; forecast from 2018/19) (£m)**



Note: Based on actuals recorded to the end of 2017/18 and forecasts from the start of 2018/19. The figures were accurate as of the May 2018 version of the Newton Fund activity tracker. The figures only include spending by the delivery partners, and so exclude core costs and funds allocated to projects that were indicated to have been dropped from the Fund.

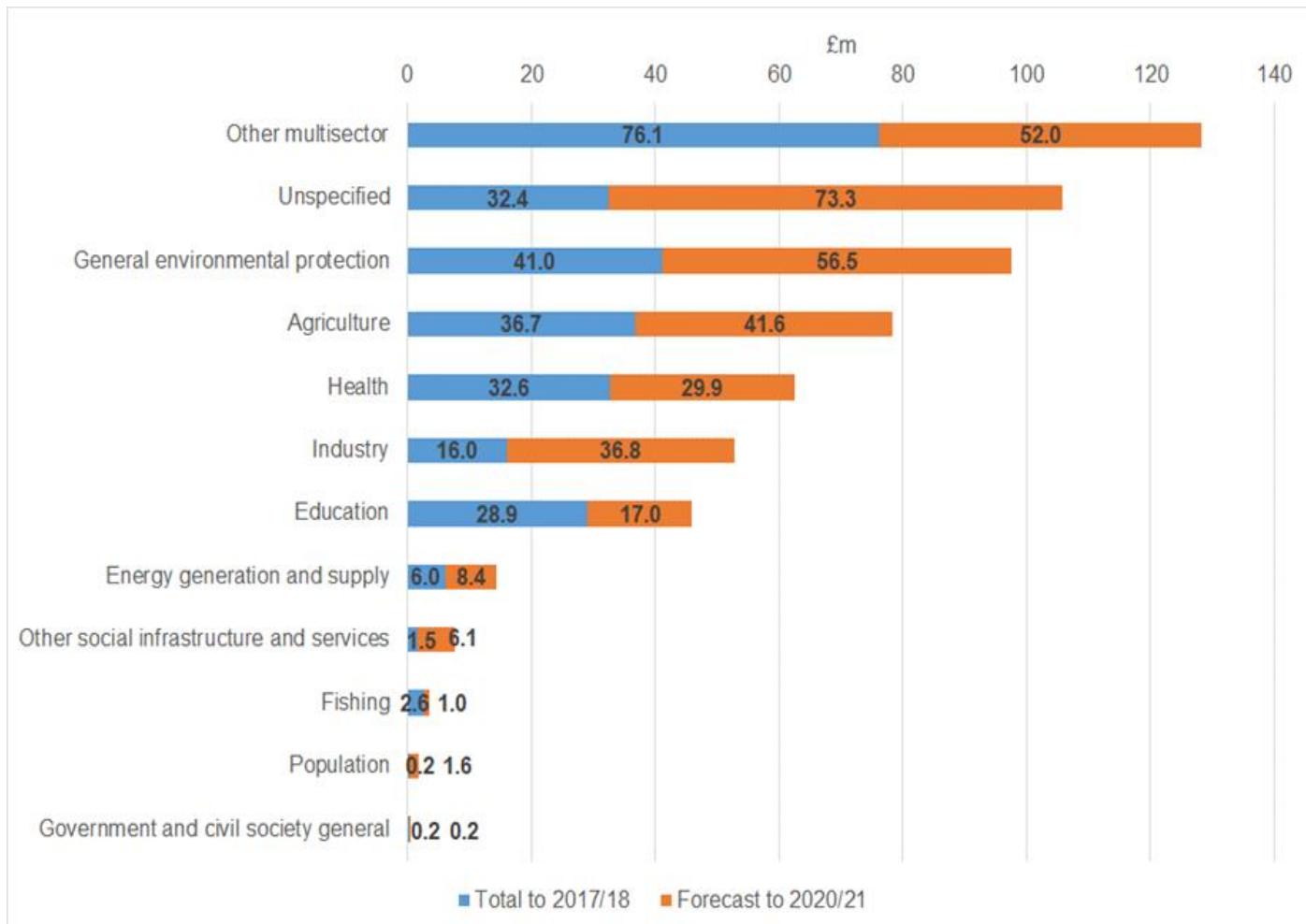
## 2.6.2 Funding by sector

Three sectors<sup>10</sup> represent almost 40% of total actual and forecast funding: general environmental protection (16%), agriculture (13%) and health (10%). The majority of funding is allocated to one of the sectors listed in *Figure 7*, a significant proportion (39%) has been classified as either 'multisector' (21%) or is unspecified (18%)<sup>11</sup>.

<sup>10</sup> Sectors have been allocated based on the CRS Aid Activity database framework

<sup>11</sup> Unspecified spending refers to spending which was not coded in the source data.

**Figure 7: Activity spending by sector (actual to 2017/18; forecast from 2018/19) (£m)**



Note: Based on actuals recorded for 2017/18 and forecasts for 2018/19. The figures were accurate as of the May 2018 version of the Newton Fund activity tracker. Spending shown excludes funds allocated to 'Delivery' and 'Monitoring' not associated with an individual delivery partner. The figures only include spending by the delivery partners, and so exclude core costs and funds allocated to projects that were indicated to have been dropped from the Fund.

Eleven countries have activities dedicated to general environmental protection and this is a major focus of activity in China and Malaysia. Agricultural activities are a particular focus in Mexico, China, and Vietnam, but are currently absent in Africa and the Middle East. Education activities are a particular focus in South Africa, Colombia and Kenya. Government and civil society projects are less prevalent (they occur in Peru, Colombia and Indonesia).

## 2.7 Summary of baseline findings

Newton Fund activities began in April 2014, more than a year prior to the commissioning of the evaluation, precluding the possibility of achieving a baseline from primary research. A baseline<sup>12</sup> was constructed from secondary data from international organisations as well as relevant background literature. The data were combined with analysis of policy and research literature to address four baseline themes: existing extent of collaborations, science and innovation capacity, translation capacity, and research funding structures and systems.

The purpose of the baseline was to **establish a starting point for partner countries in the Newton Fund** using consistent and comparable data across a lengthy time series. The baseline research aggregated the performance of partner countries across a range of indicators over time, resulting in a composite index of overall performance. Partner countries were separated into four broad groups as part of a bespoke classification. Our research found considerable divergence in the baseline position between partner countries. Some higher-performing countries ranked alongside the UK in terms of innovation capacity and research output, whilst others had relatively underdeveloped research systems and policies with limited capacity to engage internationally. The results contain a number of implications for programme delivery and the balance of activities between the various pillars. Our classification found **Malaysia, China** and **South Africa** to be the most advanced research nations, potentially capable of becoming knowledge-based economies in the immediate future. **India, Brazil, Chile, Mexico** and **Thailand** were found to have intermediate capacity, but high potential to increase it significantly during the period of Newton Fund activities (and further in the future). **Turkey, Indonesia** and the **Philippines** have intermediate capacity and underperform in certain areas of collaborative research and translation outputs. **Kazakhstan, Colombia, Vietnam** and **Egypt** were found to have less developed research capacity and are the least likely of the Newton Fund countries to become knowledge-intensive economies in the next decade.

Science and innovation capacity in partner countries was addressed by describing capacity and skills gaps (the saturation of researchers, policy challenges and global incentive structures), enabling conditions for capacity development (international researcher mobility was used as a proxy measure of internationalisation, also a key strategic ingredient) and overall innovation capacity, as measured by the Global Competitiveness Index. **All partners faced similar challenges in terms of training and retaining early career researchers.**

The translation capacity of partner countries was strongly affected by **university–industry clusters and patent registrations**. China, Malaysia and Brazil performed well on cluster development and patent registrations as well as several other indicators.

Funding in countries with high research capacity or intermediate capacity (with high immediate potential) built upon a high starting baseline, in which Newton funds constituted a smaller proportion of overall collaborative research outputs. These countries enjoy extensive research relationships with other advanced economies and have relatively internationalised research systems. Newton activity tracker data at the time the baseline was constructed suggested a well-balanced blend of activities across Newton's three Pillars among higher performing

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<sup>12</sup> The baseline exercise was completed prior to the expansion of the Newton Fund to include Kenya, Jordan, and Peru, which remain outside the scope of the evaluation contract.

countries, by which we mean those with **high capacity** and **intermediate capacity with high potential**.

Among **intermediate** countries, Newton funding in Indonesia and the Philippines was, at the time the baseline was constructed, tilted towards Research Pillar activities. Baseline indicators suggested that the two countries had limited domestic capacity and received a low rating on intellectual property transfer (patenting of research outputs).

Among countries with **lower capacity**, funding for Egypt and Kazakhstan was initially focused on fundamental capacity-building activities within the People Pillar, with little on Research at the outset.

## 3. Evaluation Approach, Methods and Limitations

### 3.1 Overview of the Newton Fund evaluation strategy

#### 3.1.1 Scope of the evaluation

The **rationale for the Newton Fund** is based on the premise that managing knowledge and advancing innovation to help tackle social challenges and drive economic growth should involve the partnering of geographically dispersed and institutionally distinct actors. The Fund is also designed to address a funding gap owing to the perceived risk and potential returns on innovative research projects for businesses, academics and investors.

Reflecting this rationale, the specific aims of the evaluation are to **establish whether the goal of the Newton Fund** – to develop science and innovation partnerships that promote economic development and welfare in partner countries – **is being delivered**; and whether it is **being delivered in a way that represents value for money**. The evaluation will also explore secondary benefits of the Fund to the UK – including opportunities for collaboration and trade.

The **scope of the evaluation** evolved throughout discussions with BEIS during the Inception and Initial Analysis Phases. Reflecting the available budget, the evaluation includes an in-depth focus on a sample of eight countries through thematic impact studies. For the mid-term evaluation it was agreed with BEIS that the focus would be on **Brazil, China, Egypt, India, Mexico, the Philippines, South Africa and Malaysia**.

#### 3.1.2 Evaluation approach

The Newton Fund involves a variety of different types of activities. Some are designed to have a **relatively direct effect** on target groups (e.g. scientists and businesses) in specific countries while other activities are designed to have a less direct but more pervasive and widespread effect (e.g. embedding an innovative culture in institutions and governments). The **challenge of attribution** is compounded in this case because the Newton Fund will implement overlapping projects under different pillars, with multiple goals that are intended to reinforce one another.

With no viable counterfactual options considered feasible and adding value, it was agreed that additional emphasis would be placed on gathering award holders' own assessments of additionality. Using information and data collected as part of the Newton Fund programme-level evaluation, the evaluation design brings together the analysis and findings from different quantitative and qualitative, primary and secondary data sources, using contribution analysis as part of a **theory-based evaluation approach**.

Based on the Newton Fund Theory of Change, developed by the evaluation team during the Inception phase, the team identified the expected pathways of change, including the role of internal assumptions and external factors. These pathways of change were tested and documented as part of our approach.

We used an **evaluation framework** to guide the data collection and analysis of primary and secondary data. It includes the evaluation questions, sub-questions where relevant, the judgment criteria the evaluation team used to answer the questions, and the indicators used to inform our judgment. Reflecting the evolution of the Fund since inception, a revised evaluation framework has been created for better relevance and poignancy and reflecting the fact that assumptions around availability of monitoring data have not materialised (there remains no comprehensive or consistent Fund-level monitoring data). This revised evaluation framework forms *Annex 1*.

The Mid-Term Evaluation draws on evidence from a range of different data sources to answer the Newton Fund evaluation questions. *Table 2* below presents a simplified version of the Newton Fund evaluation framework showing how methods and data sources are being triangulated to answer each evaluation question at mid-term (and the gaps in evidence due to the lack of monitoring data).

**Table 2: Overview of the streams of evidence used to answer the analysis presented in this report**

Simplified Newton Fund Evaluation Framework						
Evaluation questions	Sources of evidence for mid-term evaluation					
	Evaluation team				Internal Newton Fund data	Secondary data
	Baseline	Mid-term				
	Country-level baselines	Online /telephone surveys	Thematic impact studies	Process Evaluation	Monitoring data	Country strategies
1) Relevance: Do the Newton Fund design and planned interventions address the problem stated in line with needs?		✓	✓	✓	✓	✓
2) Effectiveness: To what extent has the Newton Fund effectively delivered results?		✓	✓	✓	✗	
3) Efficiency and Value for Money: To what extent was the Newton Fund delivered efficiently?					✗	

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4) Impact: Has the Newton Fund achieved its objectives?	✓		✓		✗		✓
5) Sustainability: Are the benefits that have been achieved by the Newton Fund likely to be sustained?			✓	✓			
6) Complementarity and coordination: To what extent has the Newton Fund complemented and contributed to the work of other stakeholders in the sector?			✓				

## 3.2 Evaluation methods used at mid-term

The research methodology for the Newton Fund mid-term evaluation is articulated around several data collection methods. Here we summarise the methods used and their limitations. Fuller methodological notes are contained in *Annex 2*.

### 3.2.1 Process Evaluation

The process evaluation took place over the latter half of 2017 and focused on three research areas:

- Delivery of policy priorities
- ODA eligibility
- Match funding

The questions developed (and the data gathered) support the Fund-level evaluation of relevance, effectiveness and sustainability in particular. We conducted a review of programme documents (such as business case, meeting minutes, progress reports, country strategies, contracts, and procurement) and built on these findings with interviews with relevant stakeholders including BEIS (the policy team, and the ODA Research Management Team), UK delivery partners and in-country teams. More than 50 individual interviews were conducted. The process evaluation resulted in a stand-alone report with conclusions and recommendations in the three focus areas. The final version was submitted to BEIS in July 218.

### 3.2.2 Newton Fund monitoring data

The Activity Tracker is an Excel spreadsheet used as an internal monitoring tool by BEIS and updated quarterly by the UK delivery partners. Each row of the spreadsheet describes a single "activity": technically a package of work with a single budget line which could be a call for research, a fellowship scheme, but not a single award within a larger work package. The data fields in the spreadsheet include descriptive fields (name, description, contact information, partner country, status), dates of call and funding period, and actual and forecast funding by quarter and by financial year. The activity tracker has allowed us to analyse expenditure for the four financial years 2014/15 to 2017/18, and forecasts to 2020/21. The Activity Tracker data was also used to provide contextual information for the selection of case study projects examined in the thematic impact studies (see section 3.2.5).

The activity tracker does not record the outputs of Newton Fund activities, and there is no central reporting or recording of outputs and outcomes of Fund activity. Delivery partners use different systems and collect different data on the outputs of activity and it has not been possible to obtain or aggregate this data to provide a comprehensive dataset on actual outputs and outcomes achieved to date.

### 3.2.3 Online Survey of Newton Fund Award Holders

An online survey of award holders was undertaken to gather information about their experience of international research and innovation, and to collect feedback on the Newton funding that had been received, the activities which had been undertaken, and the perceived effectiveness and additionality of the funding. The questionnaire was developed in consultation with BEIS

and delivery partners to ensure its relevance and to ensure consistent use of terminology throughout.

The survey was administered by Coffey working with a contractor who provided the web platform to host the survey. In most cases, the Newton Fund delivery partners were unable and/or unwilling to provide a full list of award holder contact details to Coffey in order to issue the request to participate in the survey. As a result, the evaluation team does not have a complete contact list of award holders, and incomplete knowledge of the total number and characteristics of award holders.

As a workaround an agreement was reached with delivery partners that they would issue the survey invitation to their award holders, whilst Coffey were able to send the invitation directly to some award holders based on contact information collected by the Newton in-country teams. Based on information supplied by the delivery partners we know that the invitation to participate in the survey was issued to more than 3,000 award holders (in some cases delivery partners did not confirm how many invitations were issued).

The survey achieved 862 responses – a response rate of 27%, based on the known population of award holders invited to participate.

### 3.2.4 Telephone Survey of Newton Fund Award Holders

The telephone survey of Newton Fund award holders was launched in April 2018 with the objective of producing more information on the evaluation framework indicators. The telephone survey was offered in multiple languages across all 15 countries. The interviews were conducted using a structured questionnaire with questions designed to collect further qualitative information on the strengths and weaknesses of the Newton Fund and its impacts on activity – it was intended to probe deeper on issues identified in the online survey to provide more detail and nuance to the findings. The total number of interviews conducted from within this population was 204.

The survey questions were designed to gather information about recipients' professional experience of international research and innovation, and specifically to collect feedback on the Newton funding which had been received. These questions were more open-ended and qualitative in nature than the online survey, and the responses were transcribed and coded so that they could be analysed.

### 3.2.5 Thematic impact studies

The thematic impact case studies were designed to provide detailed qualitative information on a small, carefully-selected set of activities in eight Newton Fund partner countries. We sought to achieve a spread of Newton Fund delivery partners and activity types across the countries in the sample, while ensuring that each case study would exemplify the approaches and specialisms in each country. In consultation with BEIS it was agreed that the impact studies would be conducted in **China, Mexico, South Africa, Brazil, India, the Philippines, Egypt and Malaysia**.

The overall Newton funding profile was examined to identify the pillars, delivery partners, and sectors which were particularly concentrated in each country (in terms of the share of total funding), and to use this to produce a shortlist of larger activities in each country which exemplified that country's specialisms. The final selection of 24 projects provides coverage across all pillars, sectors, and delivery partners. The final selection of projects is contained in Annex 2.

The thematic impact studies involved wide-ranging in-country consultations, combined with more limited consultation with the UK-based partners involved in the particular activity. The impact studies explored:

- The **development of the activity/ initiative** (origins, how engagement with Newton Fund occurred, process of securing Newton funding, etc.) – drawn from direct consultation with the award holder/ research team/ institution, the relevant Newton Delivery Partner(s), and in-country teams that may have brokered the relationship;
- Assessment of the **relevance of the activity** to the partner country's development needs – gathered through desk research, direct consultation with in-country teams, representatives of the relevant Government authorities and funders of the activity in-country;
- Assessment of the **impact of the activity** on the partner country (drawn from consultations with the individuals above, plus any wider stakeholders identified during initial consultations, e.g. businesses that have been engaged in research, departments in which an individual supported in knowledge exchange has worked, etc.);
- Assessment of **impacts** in terms of strengthening science and knowledge base, innovation capacity, influencing policy, etc. through consultation with broader group of informed stakeholders;
- Identification of **key factors of success** (and barriers) and examination of possible future benefits from the activity that might be expected to arise in the future; and
- Assessment of the **additionality of the activity** (drawing on information gathered from all sources).

Each country visit concluded with a workshop with local Newton Fund stakeholders (including those already interviewed) to present and sense check emerging findings and issues in a group setting.

### 3.3 Limitations

#### 3.3.1 Limited monitoring data at Fund-level

While the Activity Tracker is a useful source of data on actual and planned expenditure by a range of variables (Pillar, delivery partner, sector etc), the information it provides is by “activity”, which is typically at the level of a funding call; it does not provide project-level information comprehensively across the Fund.

The absence of comprehensive and consistent monitoring data on the outputs and outcomes of funded activities is a serious limitation to the evaluation as the population of award holders (and their characteristics) is unknown, and there is no data to comprehensively assess the nature and volume of outputs and outcomes being delivered by the Newton Fund. As a result, the findings of the mid-term evaluation are more qualitative in nature, with quantitative findings drawing on evidence from surveys.

### 3.3.2 Representativeness of case studies

The case studies were carefully selected to provide a sample of activities across Pillars, sectors, and delivery partners, but with the research programme restricted to eight countries for thematic case studies it is impossible to achieve “representativeness” in a statistical sense as there are not enough observations. The objective of the case study selection has been to achieve “coverage” instead; that is, to identify examples of as many types of collaboration as possible and methodically examine this to gain evidence of their common features and differences, and as far as possible why these occur, so as to be able to generalise the lessons learned to the Fund as a whole.

### 3.3.3 Representativeness of surveys

The online survey achieved 862 responses from a known sample of around 3,200 award holders, with invitations issued by the delivery partners. Whilst the known response rate was 27%, in the absence of full data on the total population of award holders in the UK and in partner countries an assessment of the statistical representativeness of the survey cannot be made.

The telephone survey was drawn from respondents to the online survey who indicated that they were willing to be re-contacted by phone. This sample is therefore self-selecting to a degree and may favour respondents who are more engaged with the Fund and the evaluation process. Again, there is no population measure against which to assess representativeness.

### 3.3.4 Limitations of scope

The Fund has evolved since the commissioning of the evaluation, with the addition of three new partner countries in 2017 (Kenya, Jordan, and Peru). The original evaluation plan did not account for the three newest countries; they were not part of the process to select case study countries and are not represented in the surveys, although they do feature in the Activity Tracker analysis. Given the relatively early stage of delivery in these countries this is not considered to be a major weakness of the mid-term evaluation, but the evaluation plan should be revisited to ensure coverage of these countries during the final evaluation.

## 3.4 Approach to the analysis and presentation of findings

The evaluation involved the analysis of different types of data, collected through different methods. To ensure that the data was analysed and synthesised in a way that provided the most objective and meaningful findings, the evaluation process:

- assessed the **quality of evidence** submitted by Newton Fund actors;
- explored the **pathways of change**, including the role of assumptions and external factors; and
- built upon **syntheses workshops** to discuss the interpretation of the analyses and the findings.

In presenting the findings, each of the headline evaluation questions has been assessed against a ‘traffic light’ rating system (see *Table 4*). This approach is considered appropriate, given the study’s objectives of making judgements of performance without introducing a false sense of quantitative precision given the limitations noted above. In each case the traffic light

system is used to assess both the performance of the Newton Fund against the criteria, and the strength of evidence supporting the conclusions reached.

**Table 3: Traffic light system overview**

Rating Symbol	Findings	Strength of evidence
	Green – rates well against the judgement criteria in the evaluation framework. Limited improvements could be made to strengthen performance against this criterion.	Green – robust and reliable evidence triangulated from multiple sources.
	Green-Amber – rates relatively well against the judgement criteria in the evaluation framework. Some improvements could be made to strengthen performance against this criterion.	Green-Amber – good quality evidence with some limitations in terms of coverage, sample sizes and ability to triangulate fully.
	Amber-Red – rates relatively poorly against the judgement criteria in the evaluation framework. Significant improvements could be made to strengthen performance against this criterion.	Amber-Red – there are limitations of the evidence in terms of availability of corroborating sources, coverage or representativeness.
	Red – rates poorly overall against the judgement criteria in the evaluation framework. Major changes need to be made to strengthen performance against this criterion.	Red – evidence is limited due to the absence of data, lack of corroboration, and in some cases due to the fact that it is too early in the lifetime of the Fund to draw firm conclusions on the research question.

## 4. Relevance of Newton Fund activities

### 4.1 Introduction

This chapter examines the relevance of Newton Fund activities to the overall goals of the Fund. Here ‘relevance’ is used with reference to OECD DAC evaluation criteria, with an

emphasis on examining the extent to which Newton Fund activity is suited to the priorities and policies of the target group, partners and BEIS as the funders of the programme. In doing so the following evaluation questions are addressed:

- *EQ1.1: Are the activities and intended outputs consistent with the intended outcomes and impacts of the Newton Fund?*
- *EQ1.2: To what extent has the Newton Fund targeted, reached and benefited its intended recipients? Are there gendered differences in terms of benefits realised?*
- *EQ1.3: To what extent have the funded activities targeted the economic development, welfare and poverty issues in partner countries?*

## 4.2 Summary of findings

**The Newton Fund is delivering activities and outputs consistent with the overall goal of the Fund in promoting economic development and welfare, and is reaching its intended target recipients**

Rating	Findings
	<p>The activities supported by the Newton Fund and the outputs delivered to date are consistent with the intended aims of the Fund, the theory of change, and the stated goals of BEIS.</p> <p>The chosen countries of focus are appropriate and are countries where there is an opportunity to collaborate and further science and innovation based on mutual interest of both the UK and the partner countries.</p> <p>Activities are observed to be compliant with ODA eligibility rules.</p> <p>There is no stated goal or objective for the Newton Fund in relation to gender equality in the interventions it supports, nor are there stated expectations from BEIS in terms of gender mainstreaming in selection or delivery processes.</p>

The Newton Fund **partner countries are 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.

Newton Fund **activities are reaching the intended recipients**, predominantly academics and PhD students and researchers, with smaller numbers of private and public sector recipients. The mix of recipients is appropriate and reflects the three Pillars under which support is provided. Reach is somewhat skewed towards People pillar activities reflecting the emphasis on these in the early years of the Fund, and the larger numbers of recipients reached by individual activities through capacity building events and training.

The case studies showed that **Newton Fund activities fit well within the results framework** established in the 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.

The Newton Fund **does not have a formal strategy or statement on expectations regarding how issues of gender equality should be promoted or integrated** in the selection, design and delivery of Fund activities. Overall, almost two thirds of known recipients to date are male, with significant variation across partner countries. There are examples of Newton Fund projects that are targeting women or gender equality issues in science and innovation, but there is no specific commitment to gender equality at Fund level.

#### 4.2.1 Strength of evidence

Rating	Evidence
GA	<p>Different strands of data have been triangulated to inform the assessment of relevance. This includes a review of documentary sources such as BEIS' Newton Fund Strategy Direction Paper (April 2018) and previous strategic documents, the Process Evaluation and thematic impact studies (case studies) to trace decision-making and determine whether the Fund's activities are relevant to Fund-level outcomes and impacts set out in the Theory of Change.</p> <p>There are some gaps in evidence which constrain the assessment of relevance: sparse decision-making documentation has made it difficult to comprehensively assess key design decisions and lack of data for triangulation makes the assessment of ODA relevance purely reliant on case studies.</p> <p>The absence of Fund level monitoring data limits the extent to which it is possible to fully assess the extent to which the Fund has reached its intended recipients (and the characteristics of those recipients); the evaluation has relied instead on evidence from the sample of award holders who responded to the online survey.</p>

### 4.3 Relevance of selected activities to Fund outcomes and impacts

**Are the activities and intended outputs consistent with the intended outcomes and impacts of the Newton Fund?**

Rating	Findings
	<p>Newton Fund activities are relevant to the intended outcomes and impacts of the Fund. The selected partner countries, Pillars and country strategies are all found to be appropriate for achieving the overarching Fund-level objectives.</p>

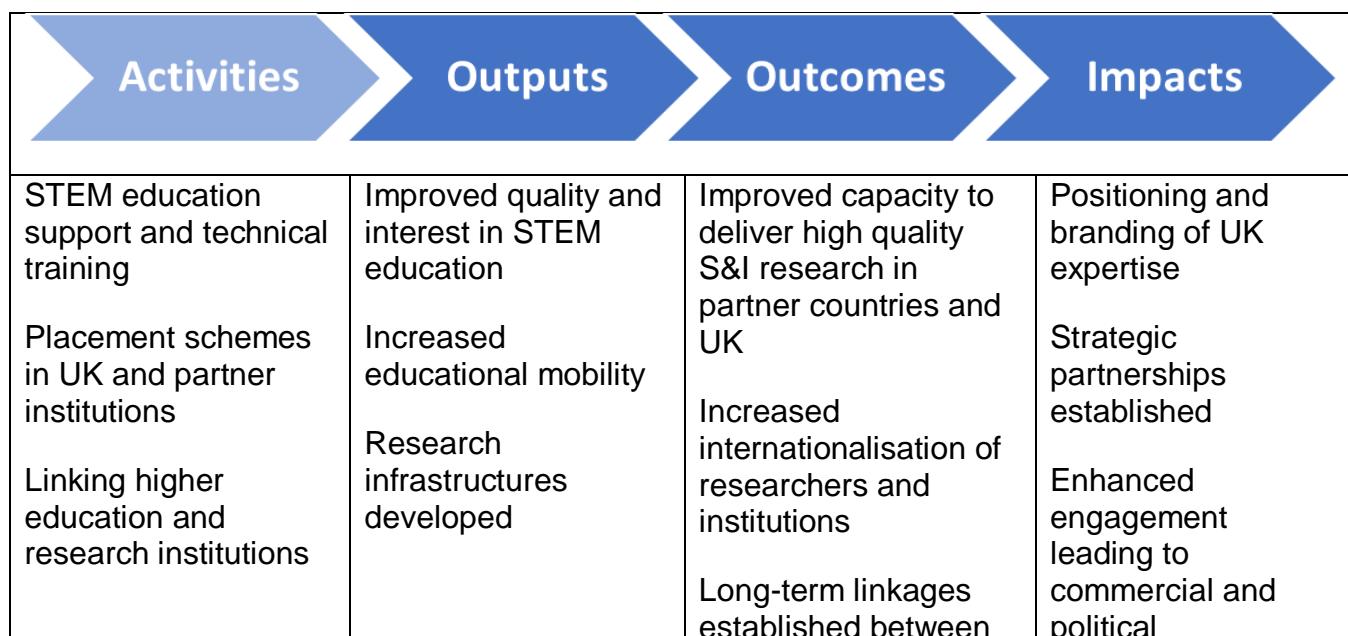
	<p>Observed activities and planned outputs are consistent with the impact pathways envisaged in the Theory of Change.</p> <p>There is no overarching strategy in place to set the overall direction and establish priorities at Fund level.</p>
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### Intended outcomes and impacts

The goal of the Newton Fund is to develop science and innovation partnerships that promote the economic development and social welfare of partner countries or, through working with the partner country, to address the well-being of recipient communities. The Newton Fund Theory of Change (ToC) defines the results (outputs, outcomes and impacts) that the Fund is seeking to achieve and contains sub-theories of change for each Pillar of activity. *Figures 8-11* summarise the intended pathways to impact.

- **People Pillar:** Activities under the People Pillar are focused on **developing human capital** to create the appropriate skills and competencies base to enable further partnerships to be established between the UK and partner countries.
- **Research Pillar:** The Research Pillar aims to **identify and address specific challenges** faced in the partner countries or in other parts of the world where UK-partner country collaborative research can make a difference on a regional or global scale.
- **Translation Pillar:** The Translation Pillar supports the **development of collaborations with industry, government and/or businesses to ensure that innovative research has a route to the policy arena or market** (via commercialisation).

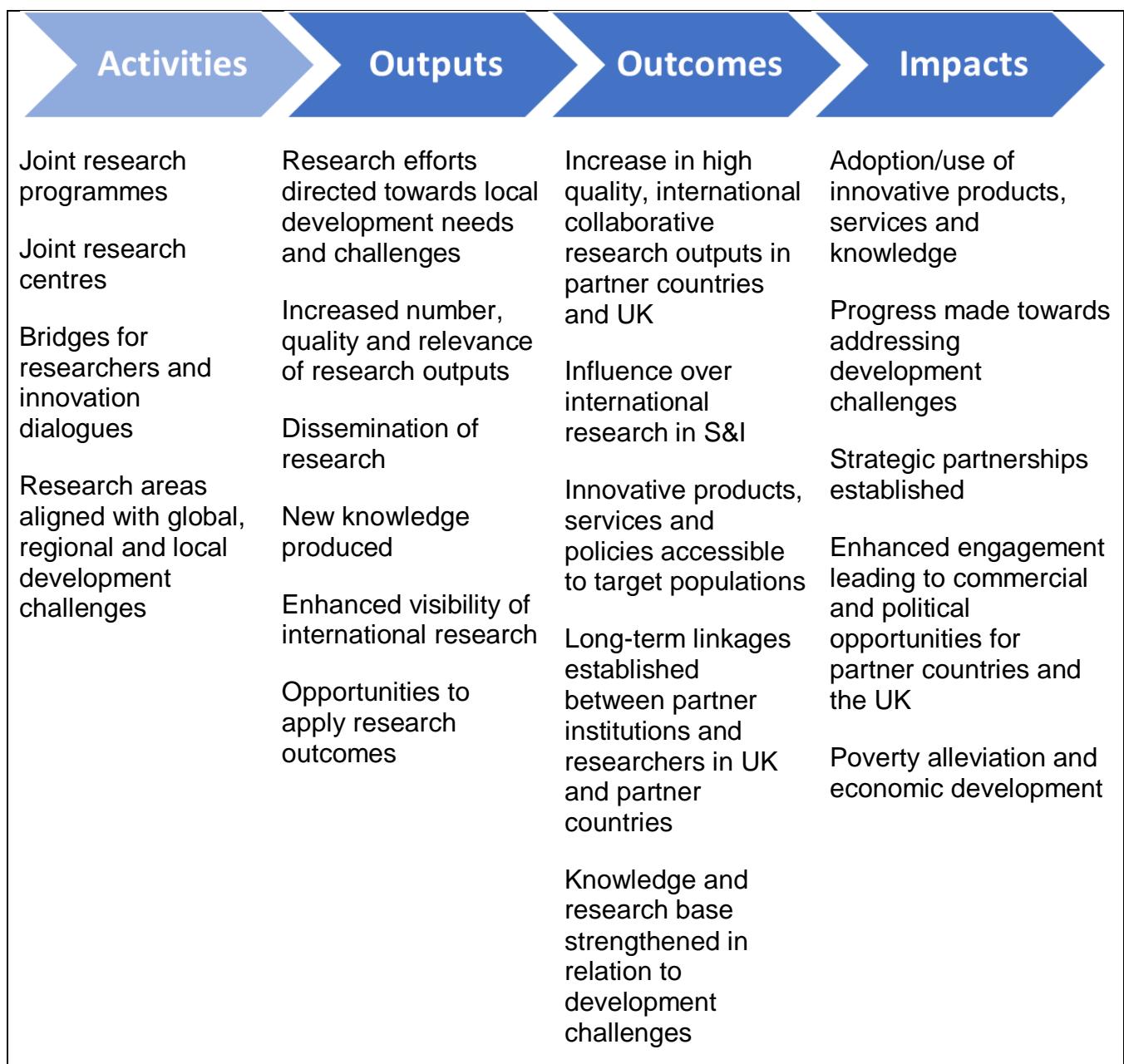
**Figure 8: People pillar impact pathway**



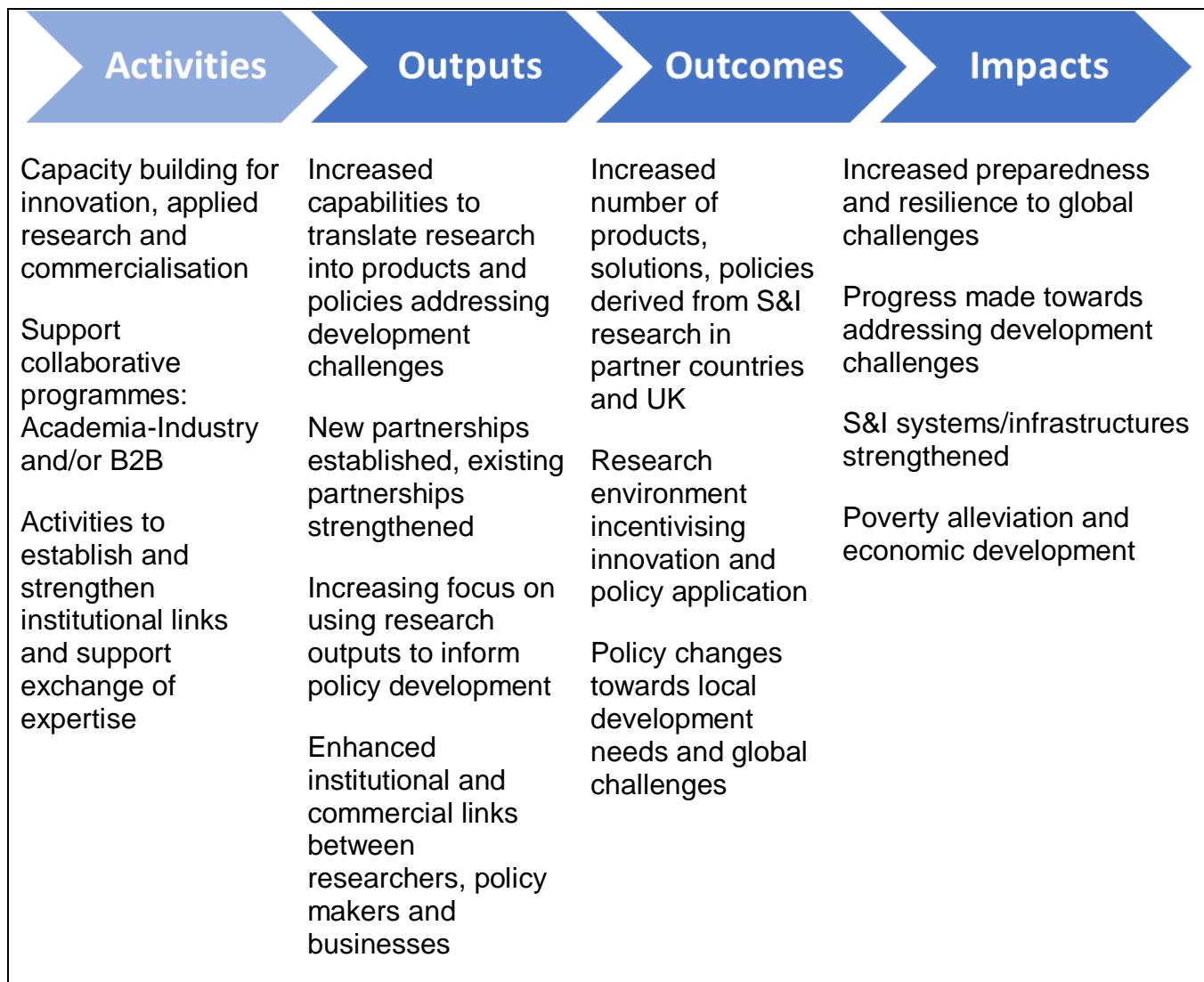
## Mid-term Evaluation of the Newton Fund

Leadership and professional development programmes	Up-skilled students, researchers and managers  Increased capacity to engage in international collaborative research (for individuals and institutions)	institutions and researchers in partner countries and UK  Knowledge/research base strengthened in relation to development challenges	opportunities for partner countries and UK
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**Figure 9: Research impact pillar pathway**



**Figure 10: Translation pillar impact pathway**



While the Fund consists of three Pillars of activity, it is not the case that all activities fall exclusively under one Pillar. Some activities are designed to bridge Pillars, others to encourage synergies between Pillars, while some act as precursors to other work under a different Pillar (for example, capacity building under the People Pillar can lead to funded activity under the Research Pillar).

### **Applied research: developing and applying new uses for rice straw**

An example of how Research activities can lead to Translation is the Developing Rice Resources for Resilience to Climate Change and Mitigation of Carbon Emissions ('Rice Resilience') project in the Philippines. The Rice Resilience project is a Research Pillar project that aims to improve the quality of rice straw for use as animal feed, biofuel production and bioenergy generation to reduce biomass burning by agricultural workers. It also aims to develop rice varieties with greater environmental resilience, especially to temperature stress and weather changes. The Rice Resilience project predominantly covers impact pathway nodes relevant to the Research Pillar. However, it is also relevant to the Translation Pillar due to its emphasis on affecting agricultural practices by using the research to encourage new uses or processes for rice straw.

## **The absence of an overarching strategy for the Newton Fund means strategic objectives, roles and responsibilities are open to interpretation**

The Process Evaluation revealed that while there is a shared understanding among stakeholders regarding the overall aim of the Fund, there is a lack of an explicit statement of the overall strategy for the implementation of the Newton Fund. Given the scale and complexity of the Newton Fund, **an overarching strategy is needed to set the direction and establish priorities**, as well as to simplify decision-making and drive alignment with country strategies<sup>13</sup>. The Evaluation Team found that while processes and responsibilities might be understood, they are not always systematically well-defined or documented, leaving room for inconsistency and inefficiency in delivering an already complex programme.

## **The chosen Newton Fund partner countries are appropriate in meeting BEIS priorities for engagement in science and innovation and foreign policy**

Tracing the Fund's pathway to impact helps identify whether the activities undertaken can be linked to intended outcomes and impacts. Activity decision-making is determined at the programme and country levels. At the programme level, the preliminary step for selecting activities is the selection of partner countries. Country selection is the responsibility of the BEIS Research and Innovation ODA Board and happened at the programme's inception (2014) and again two years later following the allocation of additional funding in the 2015 Spending Review.

A necessary first step to determining whether activities have been selected in line with the Newton Fund's ToC is to establish the rationale for the scope of Newton Fund activities. That is: have partner countries been selected to maximise the potential to develop S&I partnerships promoting the development and welfare of partner countries and extending benefits to the UK?

### **Evidence of rationale for country selection process**

The Newton Fund includes 18 partner countries, of which 17 are active as no further activities are being pursued in Kazakhstan due to difficulties in securing match funding commitments. There is evidence of a clear rationale for selecting participating countries that is in line with the overarching objectives of the Fund. According to the BEIS R&I Portfolio and Operations Management Board<sup>14</sup>, countries targeted for collaboration as part of the Newton Fund were selected based on the following criteria:

- Having been identified under the Foreign Office Emerging Powers Initiative as countries with whom the UK should be increasing its efforts to engage;
- Being on the Development Assistance Committee (DAC) list of ODA recipients; and#
- Having demonstrated a strong appetite to work with the UK to increase their ability to use research and innovation for economic and social goals.

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<sup>13</sup> We are aware that BEIS is already in the process of seeking to update all the country strategies to address this issue.

<sup>14</sup> Source: BEIS R&I Portfolio and Operations Management Board Paper 5: Newton Fund Strategy Direction Paper (April 2018)

## Mid-term Evaluation of the Newton Fund

Specifically, the Fund has focused on countries that demonstrate the strongest opportunity for UK research and innovation (R&I) engagement. Countries were assessed and ranked by BEIS based on their:

- Current R&I excellence or growth trajectory towards excellence;
- Appetite to work with the UK and to use R&I to meet their development goals;
- Priority to support UK R&I and foreign policy objectives; and
- Likelihood of meeting the conditions for partnership and match funding.

The initial selection of participants resulted in 15 countries being adopted as partners for the Newton Fund in 2014 (Table 4), falling into three ‘tiers’ based on their level of research and innovation potential. These groupings also informed initial strategies for targeting of activities, with those at early stages of research and innovation targeted with capacity building activities; whilst more developed innovation systems were to be supported through R&I collaborations:

**Table 4: Initial Newton Fund partner countries**

				<b>Tier One: Higher level of research and innovation and sophisticated innovation infrastructure</b>	<b>Tier Two: Some high-level research and innovation but aspiration to develop</b>	<b>Tier Three: Lower current excellence but increasing investment</b>
Countries	China, India, Brazil, Turkey, South Africa	Mexico, Chile, Malaysia, Thailand	Colombia, Philippines, Indonesia, Vietnam, Kazakhstan, Egypt			
Objective	Research and innovation collaborations to generate excellent research and build strong relationships	Mix of research and innovation; build strong relationships	Capacity building, training with some research and innovation collaboration			

In 2016, three new countries were added: Kenya, Peru and Jordan. Since then, there have been frequent re-examinations of partner countries in the Newton Fund portfolio. The latest position (April 2018) is that there is a clear rationale for continued focus on the existing Newton Fund countries, and the BEIS R&I Portfolio and Operations Management Board have concluded that the active Newton Fund countries:

- Offer the greatest opportunity for ongoing UK R&I collaboration;
- Are strongly positioned in terms of R&I excellence compared to other countries on the DAC list; and
- Enable the expansion of current partnerships and country relations.

## Mid-term Evaluation of the Newton Fund

Table 5 shows the BEIS Board's analysis<sup>15</sup> of R&I excellence for countries in the DAC list for 2018-2020 ODA flows. Thirteen of the top 20 countries are current Newton Fund partner countries.

**Table 5: Top 20 R&I performing countries and DAC listed income bands**

Upper-Middle Income		Lower-Middle Income	
Country	R&I Rank	Country	R&I Rank
China	1	India	2
Brazil	3	Egypt	9
Iran	4	Pakistan	11
Malaysia	5	Ukraine	13
Turkey	6	Kenya	15
South Africa	7	Georgia	17
Mexico	8	Indonesia	18
Argentina	10	Vietnam	19
Thailand	12		
Colombia	14		
Panama	16		
Lebanon	20		

Several partner countries do not appear in this list of the top 20 performing countries. Chile, which would have ranked 9th but graduated from the DAC list in 2018; the Philippines at 22nd, Peru at 24th; Jordan at 40th; and Kazakhstan at 53rd. Whilst these countries may not fulfil the criteria of being top R&I performers, their inclusion is justified based on the broader selection criteria around appetite for engagement and supporting UK foreign policy interests.

<sup>15</sup> Source: BEIS R&I Portfolio and Operations Management Board Paper 5: Newton Fund Strategy Direction Paper (April 2018)

Of the non-Newton Fund countries shown in *Table 7*, BEIS has justified the exclusion of Argentina in that it is expected to graduate from the DAC in the near future. Pakistan has been identified as having strong potential to become a Newton country and has also expressed interest in joining the Fund. BEIS is currently considering next steps. No evidence of decision-making evidence was provided regarding the exclusion of the remaining countries (Iran, Panama, Lebanon, Ukraine and Georgia).

**Activities at country level are based on mutual interest between UK and partner country priorities**

At the country level, each partner country has its own priorities aligned with the country's S&I development needs. The selection of activities within each country happens through a collaborative process between delivery partners in the UK, and funders and delivery partners in each country (with the in-country teams often acting as conduit between these parties). This ensures that activities align with the mutual interests of the partner country and the UK.

Country-level strategies are crucial for setting objectives and defining the scope for the Fund's activities in each partner country. Country strategies were developed by BEIS regional leads with the support of in-country teams and UK delivery partners, both for the original strategies in 2015 as well as for the re-drafted strategies in 2016.

**Country strategies are not sufficiently detailed or reflective of local context**

Country strategies were found not to be precise enough to be translated into operational documents to drive activity in priority areas. Most of the delivery partners found issues with the usefulness of the strategies, with some indicating that they barely refer to them at all and consider them too generic to be useful. An exception was the Met Office, who made use of the strategies.

The country strategies were designed through a collaborative exercise designed to reflect UK interests, the areas of expertise of delivery partners, and partner countries' needs and interests. Their formulation was collaborative but did not systematically involve consultation with partner country funders or delivery partners, and as a result are perceived by more than half of the in-country teams as UK-driven, as opposed to aligned to the needs and interests of partners. Despite this, evidence from the case studies demonstrate that funded activities do indeed target the needs and priorities of partner countries and examples of collaborative deliberation of priorities were evident in some countries.

The case studies found that activities were well aligned with country priorities. The degree of relevance to country strategies varied, with a handful of projects only targeting country priorities through an intermediary (or series of intermediary) steps (for example, some capacity building projects are in research topics not directly related to development challenges or country priorities but are nonetheless relevant in building the skills and experience of researchers in undertaking international collaborative research). In all cases activities are considered relevant (as explained in detail in the country case study reports).

**The Newton Fund is targeting research and innovation that targets economic development and welfare issues, consistent with ODA principles and priorities**

**To what extent have funded activities targeted economic development, welfare and poverty issues?**

Rating	Findings
<span data-bbox="176 316 247 372">G</span>	<p>All activities in our sample were found to target the economic development, welfare and poverty issues in partner countries through a variety of different activities and approaches across all three pillars of the Fund.</p> <p>A sample of thematic case studies found that Fund activities are well aligned with ODA priorities, though the degree of relevance varies reflecting the longitudinal nature of the expected impact pathways.</p>

Newton Fund activities need to demonstrate that they are aiming to contribute to a reduction in poverty, further sustainable development or improve the welfare of the population of Newton Fund countries, in line with the UK's ODA commitment. ODA eligibility is thus a key prerequisite of Fund activities and is assessed at both the country and project levels.

The question of ODA targeting was investigated in the process evaluation. No indications of concern were found, however, at the time of writing, the thematic case studies had not been conducted. Case studies provide a more nuanced understanding of how ODA targeting plays out in practice and allow for a more robust analysis of relevance regarding partner countries' development needs.

In general, all sampled projects were found to be aligned with ODA requirements, though often relying on a necessary precondition of building capacity of individuals and institutions as a precursor to then directly addressing development challenges. For example, the *Leaders in Innovation Fellowship (LIF)*, which was the subject of case study in both the Philippines and Malaysia, is a Translation project that aims to build researcher capacity for entrepreneurship and the commercialisation of research, targeting individuals who are in the process of developing a business proposition for their innovative service or product. The LIF application asked fellows to detail the societal or technical problem their innovations target, the developmental benefits their projects may have, and whether it will promote the economic development and / or social welfare of the country. Consequently, the scope of applications and projects closely aligns with several ODA and country priorities.

Similarly, the Malaysian *Research Management and Governance* call, a People Pillar activity, is another example of a broader interpretation of ODA targeting. The project aims to improve the Malaysian Higher Education system, with a focus on costing, impact and monitoring, data repository and research management. While the project does not directly target the economic development, welfare or poverty issues in Malaysia, it is helping to address challenges in the Malaysian university system with the aim of ultimately increasing the capacity and capability of researchers to respond to development challenges.

These findings are consistent with the process of activity decision-making. ODA compliance is built in from the beginning of any scoping activity, so delivery partners select thematic areas that are suitable for ODA funding. Procedures are also in place to cross-check compliance throughout the application and selection process.

### **The Newton Fund is targeting and reaching its intended recipients**

**To what extent did the Newton Fund target, reach and benefit its intended recipients? Are there gendered differences in terms of benefits realised?**

Rating	Findings
	<p>No numerical targets on award holders or sub-groups of award holders (e.g. women) have been set to orient the Fund's activities. As monitoring data on reach (number of award holders) and award holder characteristics is not available, this section only provides a proxy for award holder characteristics across the Fund.</p> <p>Based on the available evidence, the Newton Fund is successfully targeting and reaching researchers, institutions and businesses across all pillars of activity.</p> <p>Recipients of funding are predominantly male (though the gender profile varies significantly by country). There is currently no stated ambition of the Fund in terms of how gender equality and gender mainstreaming are to be promoted and supported by the Newton Fund.</p>

In the case of the Newton Fund, the term 'award holder' is used instead of 'beneficiaries' to reflect the nature of the Fund and the fact that it is unlike traditional bilateral development assistance. That is, those receiving funding are not necessarily the direct beneficiary themselves, but rather researchers and others undertaking research and other activities with the goal of addressing social welfare and development challenges.

In terms of orienting activities to the Fund's intended award holders, **no numerical targets have been set** nor are there targets or emphasis placed on sub-groups (e.g. women). Broadly, the Fund aims to reach and support four different types of award holder:

- **Individuals / researchers** – primarily under the People and Research Pillars, for instance through Newton International Fellowship schemes, PhD placements and individual research projects.
- **Groups / joint research groups** – primarily under the Research Pillar, such as through joint science-led research programmes.
- **Institutions / departments** – primarily under the Research and Translation Pillars, such as through institutional links.
- **Other stakeholders** such as policymakers or businesses – primarily under the Translation Pillar, for example, through training for policymakers.

### Award holders reached and benefitting

To assess the nature of award holders reached we have used data from the online survey. While providing some useful insights, this cannot be considered to be truly representative of all award holders as the number and make-up of that group is not known. However, the data is useful to gain insights into the characteristics of award holders to date. The data is drawn from a sample of 862 respondents to the online survey.

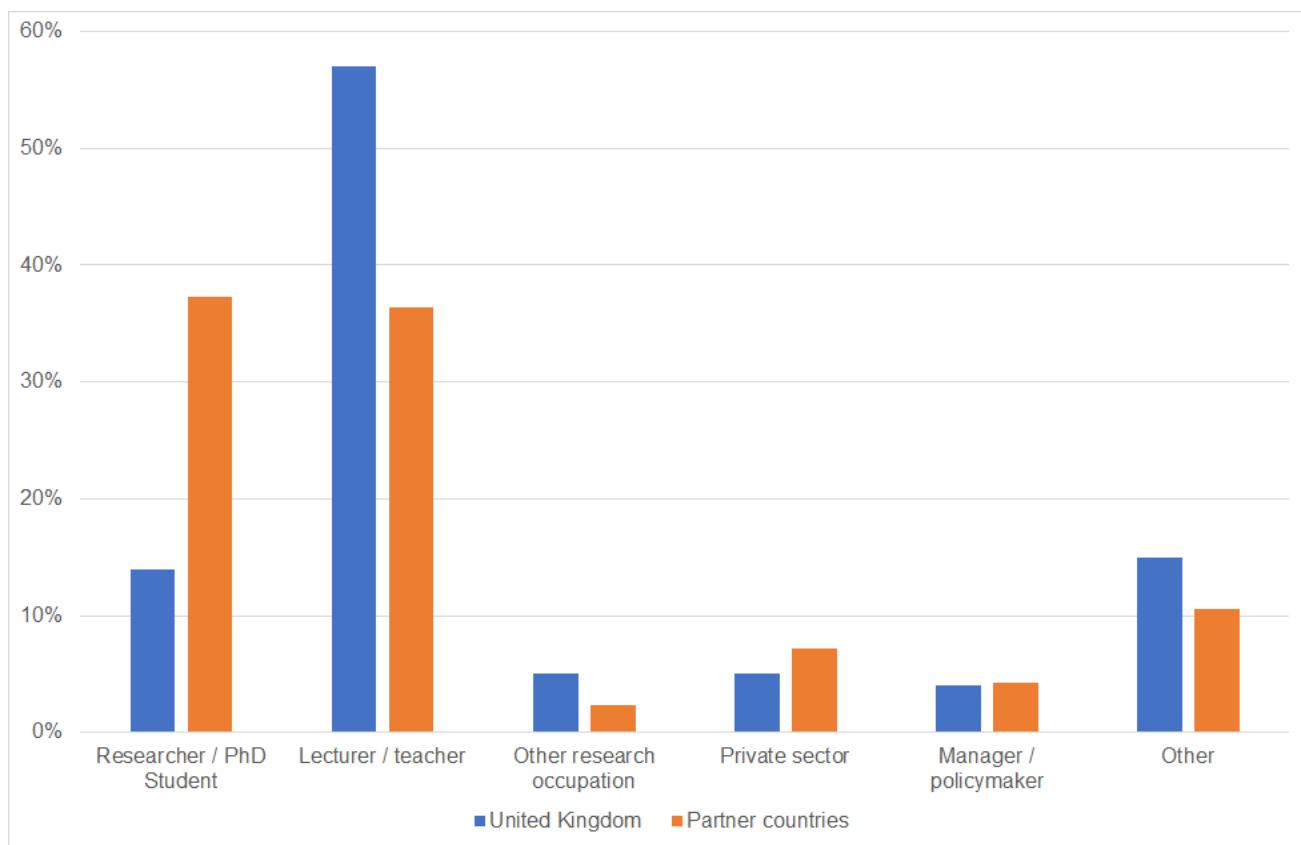
Overall, almost half (43%) of respondents were lecturers or teachers, 10% post-doctoral researchers and 10% PhD students. Compared with the UK, partner countries tended to have fewer lecturers / teachers and more PhD students and post-doctoral researchers. Chile and Indonesia, and to a lesser extent Vietnam, had significant involvement by managers / owners

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of private sector organisations (27%, 22% and 11%), while Egypt and India had very high proportions of PhD students (62% and 53%, respectively). This is consistent with varying degrees of emphasis placed on different Pillars of support in different countries – with the People pillar expected to reach more individual researchers and academics, and the Translation Pillar expected to engage more with policy makers and businesses. The majority of respondents (93%) worked in a university or research organisation. Four percent worked elsewhere in the public sector, 2% in the private sector and 1% in charities.

As shown in *Figure 11* below, there are some differences in the profile of UK and partner country award holders, with a much greater proportion of lecturers/teachers amongst UK award holders and a correspondingly higher proportion of researchers among partner country award holders. This is consistent with the nature of many of the People pillar collaborations designed to transfer knowledge and expertise to partner country recipients as a means of building their capacity.

**Figure 11: Occupation of award holder**



### Source 1:Online survey of 862 Newton Fund award holders

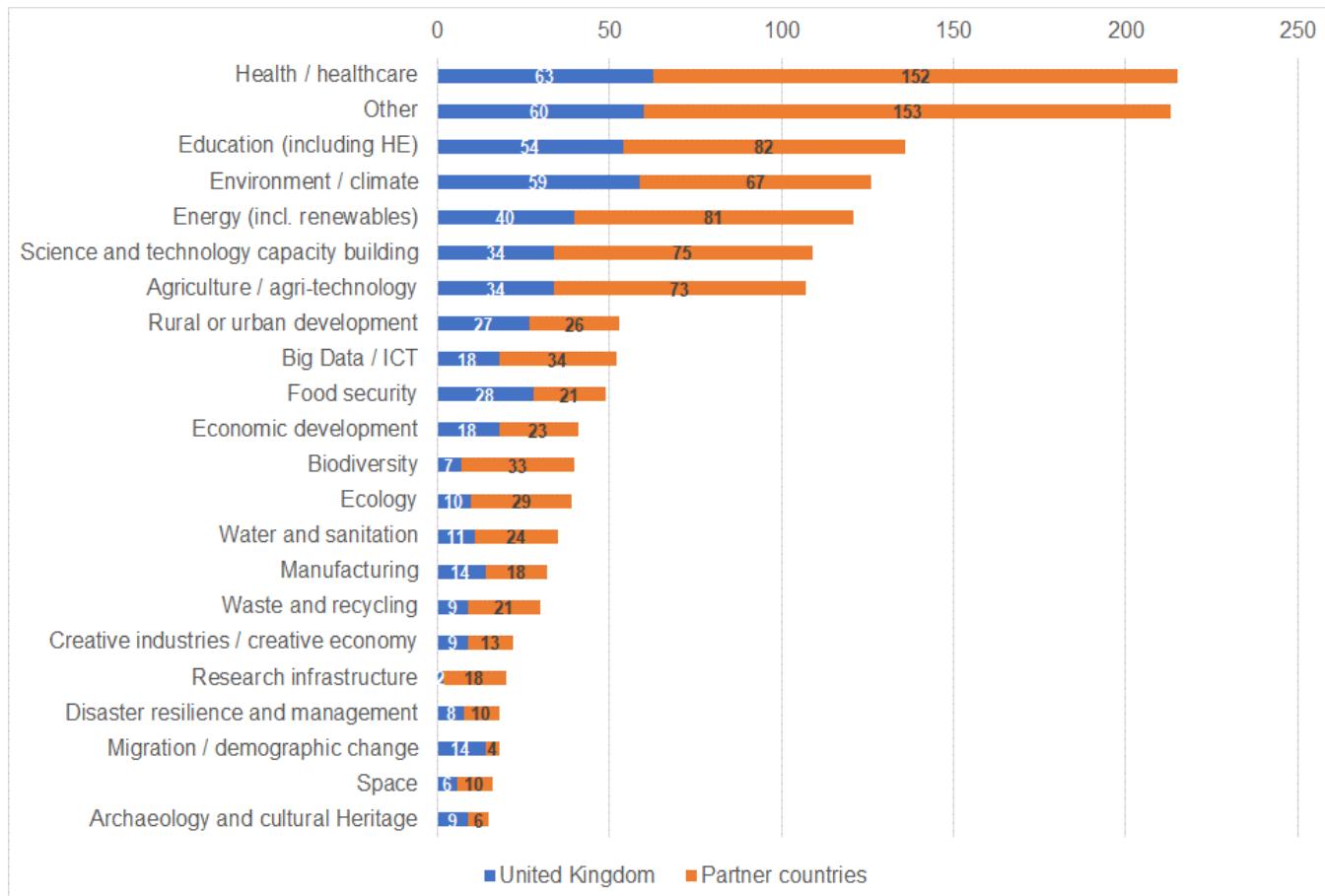
Most researchers (70%) are well-established in their field, having worked more than seven years in research. Only 3% had worked less than one year in research. India and China had much higher proportions of researchers who had worked for less than one year in research (18% and 14%, respectively), while Thailand had no respondents who had worked for more than seven years in research.

Award holders are working in various thematic areas, all aligned with Newton Fund goals and, ultimately, addressing development challenges. Health and healthcare was most common area of research (25%), followed by 16% in education (including higher education) and 15% in environmental issues (*Figure 12*).

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The pattern of research interests in partner countries differs greatly from those of the UK. Migration, archaeology and food security were the topics most prominent to UK researchers. In contrast, research infrastructure, biodiversity and ecology were the least commonly reported areas for UK researchers. This contrast in research focus between the UK and its partner countries seems unusual, as the Newton Fund's objective is to promote and foster collaboration. A more even distribution of activity in each research theme may thus have been expected. This finding may well reflect the fact that the survey is based only a sample of Newton Fund award holders.

**Figure 12: Research topics of award holders**



**Source 2: Online survey of 862 award holders. Respondents could choose multiple categories.**

### Gender of award holders

In terms of gender, the evaluation team has not found evidence (to date) of specific actions or policies aiming to proactively and systematically engage women in Newton Fund activities. Some projects target women, but there is no Fund-level strategy or guidance on how gender equality is expected to be addressed through the Newton Fund or BEIS' expectations in terms of gender mainstreaming in the implementation and management of activities. The telephone survey found that one-third of respondents<sup>16</sup> said that their project had an influence on improved gender equality within their country, yet, respondents' explanations of the means

<sup>16</sup> There was a total of 204 respondents to the telephone survey, representing 38% of individuals who opted-in from the online survey.

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through which gender equality was improved were vague, unconvincing and sometimes showed little understanding of how to improve gender equality. In order of response frequency, these included: equality within the team / female collaborators, focus on equality as part of the project, other, female empowerment, and increased employment of women due to the project.

Overall, 61% of respondents to the online survey were male. The gender ratio varied significantly between countries, from 32% male in Malaysia to 89% male in Indonesia.

## 5. Capacity-building

### 5.1 Introduction

This chapter assesses whether and how Newton Fund activities have built and improved capacities in science and innovation, for individuals and institutions. Though focused on Newton partner countries, this section also looks at capacity-building of UK researchers and institutions. By drawing cross-country comparisons through responses to the online survey, the telephone survey and case studies, the section identifies factors which contribute to building absorptive science and innovation capacity and identifies lessons which can help inform programming of the Newton Fund in the future. The fit with the Theory of Change is summarised below.

#### **Capacity-building - Fit with Theory of change**

Capacity-building is key to all Newton Fund activities. While central to the People Pillar, it is cross-cutting across pillars, in that it supports (and creates one of the necessary conditions for) collaborative research and translation of research into innovative products, services or policy.

Involving early-career researchers and graduates in collaborative research and capacity-building activities can develop local human capital. Improved skills can help developing economies meet their economic and social needs through diffusion and uptake of technologies, practices, and policies. Central to this logic is the idea that knowledge (often in the form of academic and research outputs) is a driver of economic development, creating positive externalities and spill-over effects which contribute to productivity growth.

We answer the following evaluation question:

- *EQ 2.1: Have activities under the People Pillar improved capacity building in science and innovation (for individuals and institutions)?*

We also present findings regarding the **additionality** and added value of the Newton Fund in these areas (*EQ1.4*). Finally, we identify **facilitating factors for successful capacity building within the Newton Fund**.

## 5.2 Summary of Findings

**The Newton Fund has improved individuals' and institutions' capacity to deliver high quality science**

Rating	Findings
G	<ul style="list-style-type: none"> <li>The Newton Fund is successfully building the capacity of individuals to advance science and innovation in partner countries and in the UK.</li> <li>The Fund has also built institutional capacity in partner countries which has enhanced the management and organisation of international collaborative science.</li> </ul>

There is strong evidence that Newton Fund activities have **successfully built the capacity of individuals and institutions in partner countries and the UK**. Primarily this has been achieved through training; access to UK research infrastructure and technology not available in partner countries; and networking and mentoring opportunities between UK and partner country award holders. The ability of the Fund to **foster and support long-term collaboration** is a strength of the model.

Management and coordination of the Newton Fund within partner countries has posed some challenges for participating institutions. This has led in some cases to investments in dedicated management and administration roles to facilitate the delivery of the Fund, particularly in institutions which had no or limited prior experience of international collaboration. **This has enhanced the capacity of these institutions to manage and administer large funding programmes**, and in some cases is reported to have increased the quality of research outputs.

A critical success factor is ensuring sufficient 'face time' and interaction between the collaborators to enable greater knowledge transfer. Follow-up refreshers and opportunities to further develop networks and relationships formed during training activities are a key factor in ensuring lasting benefits and continued collaboration.

The role of the in-country teams is also a crucial factor in enabling institutional capacity building. They facilitate introductions and initial co-operation activities providing valuable knowledge and insight to in-country partners on how to best manage and administer Newton Fund activities. **In-country teams' context specific knowledge and understanding has been critical in facilitating the creation of new partnerships and collaborations.**

### 5.2.1 Strength of Evidence

Rating	Evidence and limitations
	<ul style="list-style-type: none"> <li>In the absence of comprehensive monitoring data, the evidence base for this area comprises the Activity Tracker analysis, results from the sample of award holders responding to the online and telephone surveys and examples from the sample of thematic case studies conducted in eight countries, primarily from the People Pillar but also from the research and Translation Pillars<sup>17</sup>.</li> <li>In addition to the limitations relating to a more qualitative approach, our findings here are based on self-reporting, as an assessment of actual capacity improvements was not possible within the timeframe of the evaluation.</li> <li>Although there are risks that award-holders paint a positive picture of their experience participating in the Newton Fund – for example, if they were interested in applying for additional funds this potential bias was mitigated by informing respondents that all findings would be made anonymous, and, as such, not traceable back to them. We have further mitigated the risk of bias through triangulation between different data sources.</li> </ul>

## 5.3 Capacity-building for individuals

### Training, access to infrastructure, mentorship and networks as capacity building mechanisms

Academic researchers and research or industry professionals saw their capacities increase. The main mechanisms were: access to training; access to research infrastructure; access to mentorship; and access to networks and conferences (visibility).

Capacity was built through **direct training provision** in identified areas of need and through mobility and fellowships, which have offered opportunities for mentorship, visibility, and research collaboration. These initiatives have also brought access to research facilities and infrastructure.

In general, recipients considered the training provided by Newton Fund projects to be high-quality and to respond well to skill gaps. Training activities exposed participants to methodologies, tools, and technologies often unavailable in the partner country. Newton funding provided access to high-level expertise and UK and global best practice. Trainings and workshops were participatory and intensive, and trainings held in the UK, provided access to

<sup>17</sup> Among the nine People Pillar projects analysed in the case studies, five were Fellowships or mobility exchanges. The remaining four specifically focused on providing training, although other programmes often included training activities as part of their intervention. Due to the cross-cutting nature of capacity-building across the Newton Fund, we draw on examples from the Research and Translation Pillars where relevant.

high-quality infrastructure and research facilities, the importance of which is further highlighted below. Training also constituted an opportunity for network creation and peer learning, which were especially valuable in contexts where such initiatives are scarce.

However, follow-up was not always included in training design and substantial capacity gaps remain, leaving an appetite for additional training initiatives, as well as refresher courses on previous trainings.

Particularly successful training initiatives highlighted by the case studies include:

- In South Africa, the training opportunities offered by SASIE contrast with the more isolated day-to-day routines of South African PhD students. Newton Fund capacity-building activities provided a rare opportunity for practical training and learning, hands-on experience, and exposure to international networks, as well as peer-to-peer learning.
- Again in South Africa, the DARA project resulted in increased capacity in radio astronomy and related fields. This was made possible by access to practical experience, state of the art facilities and leading experts in the field. As such, DARA was described by its organisers as “*a unique opportunity for the trainees to build their capacity in both technical and theoretical aspects of radio astronomy*”.
- In Mexico, respondents to an online survey administered by Coffey<sup>18</sup> highlighted the high quality of the training delivered to Technology Transfer Office (TTO) professionals. The training was appreciated for being practical, hands-on, and a good introduction to the theme covered. Respondents also indicated that they were not aware of any training of this scope and depth having been delivered in Mexico prior to or following this initiative. However, respondents highlighted that technical skills do not necessarily translate into capacity to develop and commercialise innovative products.

In some cases, Newton Advanced Fellowships also included direct training activities, often during visits to the UK. These helped the award-holders and their teams carry out their research activities, by improving their technical skills and familiarity with the relevant methodologies. For example, in Egypt, a series of trainings was delivered to provide the team with the necessary tools – software and methodological – to be able to carry out rigorous analysis.

The provision of direct training to Newton Fund participants was not exclusive to People Pillar activities. In three case study countries, a training component was included within a Research Pillar collaboration to ensure all participants were up to speed with the tools and methodologies used and to ensure that the international teams could successfully work together. For example, in the Philippines, the ENSURE project (Enhanced Surveillance for Control and Elimination of Malaria in the Philippines), the research collaboration included training for one month in the UK “*to maximise use of technology back in the Philippines*”. The improved capacities which resulted in a successful collaboration between the UK and Philippine teams.

Several People and Research Pillar activities supported capacity-building by **providing access to infrastructure and technology not available in their home country**. This gave researchers the opportunity to apply their work in an advanced laboratory setting, which in

<sup>18</sup> This online survey was administered by Coffey as part of data collection for the Mexico case study. It was distributed to the 28 training participants in February 2018. Of these, 13 completed the survey and follow-up phone interviews were conducted with two respondents. For additional details, please see the Mexico case study report.

some cases would not have been possible without the Newton Fund project (12% of online survey respondents indicated that the same level of access to advanced equipment and data would have not been possible in the absence of the Newton Fund).

For example, a Newton Advanced Fellow and her team were able to access research infrastructure and laboratories not available in South Africa through a Fellowship in the UK. This enabled the team to carry out statistical analysis required for genetic association studies. Similarly, a Fellow from Brazil was able to use his time in the UK to visit library facilities and archives, accessing literature not available in his home institution.

Some Research Pillar activities were also facilitated by access to UK state-of-the-art infrastructure. In Brazil, rapid and precise genetic mapping of the Brazilian strand of the Zika virus was made possible by access to UK laboratory infrastructure. This allowed the research team to have quicker results, as is further explored in *Chapter 6*. Similarly, in the Philippines, the collaboration between the University of York, PhilRice, the Philippine Carabao Centre and the Vietnam Field Crops Research Institute provided access to research equipment and training previously unavailable to the research team in the Philippines.

In the People Pillar in particular, Newton Fund projects promoted collaboration between senior and junior academics. The **mentorship aspect** of this collaboration was important to several award-holders, and helped improve the quality of their research, as well as their capacity to engage in international research activities. For example, in Mexico, a Newton Advanced Fellow stated that among the main benefits of the Newton-funded activity was the opportunity to receive strategic and technical advice from her UK counterpart. During the respective visits to each other's institutions, she received strategic and technical advice through face-to-face interaction, strategic workshops and planning meetings. Similarly, a Fellow in Brazil reported that continued interaction with his UK counterpart and with the research community at Bristol University provided constructive criticism to his work, helping him grow as a researcher and academic.

All Newton Advanced Fellows included in the case studies reported access **to new networks, conferences, and other opportunities for dissemination of their work at the international level** – often for the first time. Participating in prestigious international events has enabled access to debates and innovations in the field, leading to a productive exchange of ideas. It also increased visibility, which can help establish networks with other researchers at the international level and increase capacity for collaboration in the future. For example, a Fellow in Mexico presented her work at an international conference in Zurich, which raised interest in her research and has led to a new collaboration in a field previously unexplored by the researcher and her team.

Accessing UK research infrastructure and expertise through exchanges and extended stays also helped form new networks. In the case of DARA, the four UK partner universities (Leeds, Hertfordshire, Manchester and Oxford) are centres of excellence in the field of radio astronomy. Access to these institutions and their expertise has helped create international research community links across the countries participating in the programme. In the case of SASIE, the Summer School programme at the University of Essex saw Fellows from South Africa and the UK live together on campus. This provided the opportunity to build relationships, share ideas, and strengthen networks, building capacity through peer-to-peer dialogue and exchange.

### **Activities support increased capacity to successfully engage in international collaboration activities**

The different mechanisms outlined above have resulted in **increased capacity to successfully engage in international collaboration activities**, through technical, communication and cross-cultural dialogue skills. In some cases, Newton activities have resulted in career progression for participating academics within their home institution. In a small number of cases, the improvement of skills through Newton has helped researchers leverage additional funds. A snapshot of the direct results from capacity building activities is captured below.

Respondents to the online survey identified some of the direct results of capacity building activities. A small percentage of respondents identified training initiatives as the key aspect of Newton which led to collaborative research outputs or capacity to conduct more research. A small proportion (1%) also noted that Newton funding allowed them to leverage funding from other sources as a direct result of the skills learnt through Newton and its networks. In addition, 14% of respondents stated that the Newton Fund benefited them through unexpected personal development, such as through English skills and career development.

The combination of training, mentorship, access to high-quality facilities and international expertise have led to improvements in the capacity to engage in international collaboration. There is also evidence that international collaboration itself can improve capacities. It provides a ‘learning-by-doing’ opportunity which makes participants more prepared to engage in international collaboration. The importance of the changes in capacity resulting from international collaboration emerged from the online survey in which 83% of non-UK respondents agreed or strongly agreed with the statement ‘my research skills have improved as a direct result of collaborating with UK partners’. Among the respondents, 89% agreed or strongly agreed that collaboration improved the quality of their research, 83% that it improved their research skills, and 82% that it improved their chances of securing future research funding. Three of the four Fellowships included in the case studies have already engaged in new international collaborations, both within and outside of the Newton Fund. Some of the collaboration activities are with the same partner as the Newton Fund collaboration, while others have resulted from the access to networks brought about by the Newton Fund. Examples include:

- In Brazil, a Newton Advanced Fellow is continuing to work with a UK PI (now at a non-UK institution) through a British Rising Star Engagement Award, as well as a European Research Council grant. The Fellow has plans for collaborative publications with UK researchers he met during the Fellowship.
- In Mexico, a Mexican and a UK researcher are already planning new collaborations and working to identify new sources of funding, including through upcoming Newton Fund calls. The Mexican PI is also working with the University of Bern and planning for a partnership with the California Department of Toxic Substances Control. Both were made possible through the international networking brought about by participation in the Newton Fund.
- In South Africa, collaboration between a Fellow and UK researcher is continuing through the UK’s National Institute for Health Research. For the South African Fellow, participation in the Newton Fund has meant expanding her professional network with

UK centres of excellence such as MRC Centre for Drug Safety Science, the Department of Molecular and Clinical Pharmacology, and the Department of Biostatistics at the University of Liverpool.

There are some examples of **career progression** resulting from the Newton Fund capacity-building activities:

- A Mexican Newton Advanced Fellow had, at the time of the case study research, been recently promoted to Tenure Professor (see box).
- In South Africa, some DARA fellows have already progressed their academic careers. The technical training in operating and maintaining the radio telescope has resulted in most of the trainees from Ghana securing PhD placements.

### **Fostering collaboration through capacity-building: the case of the Newton Advanced Fellowship**

The trajectory linking capacity-building, increased collaboration, and production of policy-relevant research is exemplified by the case of a Newton Advanced Fellowship which brought together researchers from the Institute for Scientific and Technological Research of San Luis Potosí (IPICyT) and Heriot-Watt University. This project brought together geologists and water technology experts to quantify and respond to arsenic contamination in water sources and maize production in Matehuala (San Luis Potosí).

Exchanges and extended stays in-country have led to increased capacity for international collaboration, as well as a potentially long-term collaboration. Several factors have contributed to the success of this initiative such as extended face time, with numerous in-country visits on both sides of the partnership; mentorship and professional support on the part of the senior UK academic; exposure to international networks which led to increased visibility of and interest in the research project; flexibility to accommodate the researchers' needs and commitments; and exposure to fieldwork and applied science for both the Mexican and UK participants.

For the participating Fellow, this resulted in career progression through promotion, as well as publications and research visibility. The initiative resulted in the successful research collaboration of a large team, which is planning to continue working together beyond the lifetime of the Newton Fund activity. It has also resulted in several interventions, such as a mapping of contaminated water sources and training on alternative agricultural practices, which are being delivered at the community level to reduce the negative health impact on the local community. In order to lead to socio-economic impact, what remains challenging is engaging with the authorities and policymakers. This will ultimately be necessary if change is to happen on the ground, namely through the exploration of alternative water sources in the Matehuala region.

### **Capacity building with spill-over effects**

Training has often been accompanied by **skill transfer to a broader research team**, in turn leading to institutional strengthening. Four of the case studies discussed the capacity-building improvements on students and young researchers in partner countries brought about by participation in Newton Fund projects. These gave young researchers the opportunity to

receive training and support from UK professors and institutions; and conduct hands-on research in their areas of interest.

According to young researchers and research team members, participation in Newton Fund activities exposed them to international academic circles for the first time, which improved both their intercultural communication skills, and their research skills. For instance, in Egypt, the wider student community benefited from the training offered to the PIs as part of a Newton Advanced Fellowship. Once back in the University, the PIs organised dissemination activities for the advanced methods of social network analysis they had received training on. Similarly, in South Africa, participation in a Fellowship entailed receiving highly-specialised training in genome-wide association. In turn, this strengthened the pharmacogenetics division in the participating university, as the Fellow transferred the newly acquired skills to the wider team.

### **Capacity-building as a precursor for translation activities**

The Newton Fund's ability to generate innovative products, services, or policies depends on translation capacity. When bringing partners together in the Translation Pillar, the Newton Fund in some cases improved the capacity of participants **directly** (as part of the activities funded in this Pillar), through training initiatives and workshops, and **indirectly**, by fostering collaboration and peer-to-peer learning. This created the prerequisites for some of the collaborations under the Translation Pillar explored in *Chapter 7*.

Several Translation Pillar projects have **trained researchers** (be they academic or industry-based) on the development of processes, services and products which can be commercialised. In our sample of projects, Translation-related training activities were less common than other types of capacity-building. The online survey asked respondents if they had received training or support related to commercialisation and innovation during their most recent Newton Fund activity. Of the 862 respondents, only 6% (50) stated they had received that type of support. Of the programmes which fall under this category, the one with the largest scope is the Leaders in Innovation Fellowship (LIF) programme, which operates in all Newton Fund partner countries except Indonesia, Jordan, Kenya, Kazakhstan and Peru.

The case studies found evidence that the **capacity for translation has increased in the sampled projects**. Some of the ways in which capacity for translation was built for individuals and institutions include:

- In Malaysia, a Research and Innovation Bridges project has helped industry and academic partners improve their knowledge of each other's work – thus improving their capacity to work together and increasing potential for industry-academia linkages. By facilitating workshops between the two sides of the collaboration, the Newton Fund acted as a catalyst for the collaboration. This helped Malaysian academics improve their understanding, ability to disseminate research and to work with industry.
- In Malaysia and the Philippines, the Leaders in Innovation Fellowship (LIF) enhanced participants' knowledge and understanding of how the business world works, and the entrepreneurial mindset. Support received included marketing and business proposal writing, knowledge sharing on commercialisation processes, understanding of intellectual property and licensing, improvement in negotiation skills, and increased confidence through presentation tips. As a result, several fellows have developed new projects or products, and have established new industrial links.
- In Mexico, TTO professionals who participated in Technology Transfer training reported applying lessons from the training to their institutions. One participant has applied the

lessons learned from the training to set up a new technology transfer institution, following the model presented by the training delivery partner.

## 5.4 Capacity-building for institutions

The Newton Fund has required adaptation on the part of participating institutions, especially those with no or little previous experience of international collaboration. Identified improvements in capacity have taken two main forms:

- improvements in administering and managing large international funds, both at the funding institution level, and the partner institution level; and
- improvements in academic quality resulting from Newton Fund activities.

### **Administrative capacity improvements for local partners through Newton Fund activities**

Administering the Newton Fund has been challenging for institutions in several partner countries. Some of the challenges encountered included dealing simultaneously with multiple UK delivery partners, and difficulties in transitioning from traditional models of bilateral 'aid' to active partners providing match funding and strategic involvement. The greatest change was observed in academic institutions which had not previously engaged in international collaboration programmes in the past.

The challenges encountered have led **local funding partners in some countries to strengthen their capacity** to engage in international collaboration and better manage large-scale international funding programmes. For example, in Brazil, due to its size and complexity (with large numbers of partner institutions) the Newton Fund has resulted in improved management of international programmes. Some state funding institutions made changes as a result of the Fund: for example, one created a Department of International Relations specifically to enable it to manage Newton Fund matters. In addition, the Brazilian National Council for State Funding Agencies (CONFAP) created an internal team whose role is to manage the Newton Fund. Similarly, CONACyT, the main national counterpart of Newton activities in Mexico, created two specialised sub-divisions in the International Relations department: Scientific Cooperation and Technological Cooperation.

**Some partner academic institutions also developed administrative processes through involvement in the Newton Fund.** In the case studies, there were examples both of direct and indirect capacity improvements. In the first case, improvements in capacity resulted from initiatives where the main, explicit objective of collaboration was to improve capacity through training and collaboration. In the second, improvements resulted from the collaboration itself and learning-by-doing in managing international cooperation agreements.

In Brazil, participating institutions had to increase their administrative flexibility in response to the requirements of the Fund. It is expected that this will allow these institutions to participate in more international cooperation programmes in the future.

In Mexico, a project showed improved capacity at the institutional level. The MoU which was required to begin cooperation under the Newton Fund proved challenging to agree and led to delays in project activities. However, there is anecdotal evidence of institutional learning since this experience: more recent Fellows in the same institution did not experience the same delays and challenges for the participants. The administrative staff learned from the first experience and requested an extension in the project prior to the start of activities. By

anticipating the delay, participating researchers were able to plan research activities accordingly.

### **Improvements in research quality through Newton Fund activities**

Case studies also provide examples of improvements in academic quality. This took several forms including establishing new curricula or areas of research; improving research facilities and infrastructure; fostering multi-disciplinarity and collaboration within partner institutions; and attracting high-quality academics and students to partner institutions.

**New areas of teaching and research were supported by the Newton Fund.** In Brazil, the Newton Advanced Fellowship fostered the creation of a new post-graduate programme in International Relations in one of the participating Institutions. Similarly, in the Philippines, the LIF programme led to the introduction of two new courses in related fields (a Master of Science in Data Science and a Master of Science in Innovation and Business) in one of the participating Universities. This is reportedly because the LIF collaboration led to a “*deeper appreciation of the process of research and technological development*”.

**Access to international best practice and high-quality research infrastructure has been a component of Newton Fund support.** Nearly half of respondents to the online survey indicated that the activity has resulted in researchers on their team having improved access to infrastructure. In addition, more than a quarter (28%) stated that the project resulted in their own institution having improved infrastructure. For example, in South Africa, the Hartebeesthoek Radio Astronomy Observatory (HartRAO) benefited from technical and infrastructural improvement (for instance, the purchase of new computers, new training equipment and other technical equipment related to radio astronomy).

In addition to fostering international collaboration, some Newton Fund projects led to more cooperation, dialogue and learning across teams and departments within the same University which led to **increased multi-disciplinarity**. In turn, this improved the institutions’ capacity as a whole to produce high-quality interdisciplinary research.

In Egypt, the “LIFE” project created a new link between the Department of Forensic Medicine and other University departments. This increased the University’s capacity to work in an interdisciplinary way on forensic medicine issues. In South Africa, training for the DARA project led to silo-breaking at the institutional level:

*“...Previously many research teams and technicians at the facility... would have limited interaction with each other. During lead-up and development of the training, however, researchers and technicians worked as an integrated multi-disciplinary team. This led to a wider understanding of the respective technical areas and research fields, as well as generating new cross-team projects.”*

Participation in the Newton Fund supports the creation of a **virtuous cycle** in research excellence. Newton-funded activities improve the capacity-building of researchers. In turn, this can lead to improved research quality and more visibility for the participating institution. This is accompanied by more funds and increased participation in international exchanges, which can help strengthen the capacity of the participating institution. In turn, the prestige associated with the Newton Fund helps attract high-quality researchers. This raises the quality of the research team as a whole and further fosters peer learning and capacity-building among team members, which can help attract further international collaboration opportunities. For example, in Egypt, when speaking about the LIFE projects, a respondent stated: “[the Newton Fund] is prestigious, this project is where all the good researchers go.”

## 5.5 Capacity-building for UK partners

**The online survey shows a positive outlook on the value and benefits of the partnership on the part of UK respondents.** Among the UK respondents, 68% stated that their research skills have improved as a direct result of collaborating with international partners through the Newton Fund. In addition, 27% of UK respondents stated that the biggest impact on their research project was that *'the international partner helped improve the quality of my research'*. This was reported to be the second biggest impact by 36% of respondents.

Case studies also pointed to various benefits to the UK side of the partnership. One of the main benefits was related to **capacity-building stemming from spending extended periods of time in-country, which improved research skills, and allowed participants to engage in hands-on research and conduct fieldwork.** This was found in Mexico, Brazil, South Africa and India.

**More generally, collaborating and dialoguing with researchers, academics, and innovators in other countries was often seen as leading to improvements in capacities to conduct research.** In China, UK researchers spoke about the value of “[discussing] research priorities with people in other countries”. In Brazil, “*bridging language and cultural barriers through this collaboration gave [the UK PI] access to academic literature in a field in which he was not previously familiar. In turn, this enriched and informed his own research.*”

## 5.6 Additionality and added value of Newton Fund capacity-building activities

### Capacity-building activities show high levels of additionality

The online survey shows a high-level of self-reported additionality of the Newton Fund for capacity-building activities. This was especially the case in terms of their ability to organise these activities: 57% and 53% considered Newton funding to be essential for workshops and training programmes respectively. Newton funding was considered essential for attendance by 43% of respondents for workshops, and 41% for training programmes. **Only 1% of respondents for workshops and 2% for training programmes said that they would have been able to organise or attend this activity without Newton funding.**

For example, in Mexico, **capacity gaps in Technology Transfer Offices (TTO) were identified through a Newton Fund activity.** When the British Council attempted to work with TTO staff through Institutional Links some of the challenges and needs of these institutions were identified. The British Council organised a Newton-funded training programme designed to help bridge some of the identified gaps. A training of this type **had not been organised before or since the Newton Fund activity** – despite high levels of interest on the part of Mexican partners. This suggests other funds to organise this type of activity to such a high standard do not exist there and that without the Newton Fund, it is unlikely the training would have taken place.

Similarly, respondents in Malaysia compared the capacity-building aspect of the LIF programme to other opportunities available in the country:

*“The LIF programme provides a platform for academics in commercialisation that did not already exist. One respondent who had experience of other existing entrepreneurial*

*programmes outside of LIF said they have never been very successful. Mentors on the LIF programme provide answers to technical questions and give direct advice.”*

In Brazil, the **timing** of the Newton Fund was crucial. Here, the Newton Fund helped overcome some of the limitations of the national funding landscape, especially in the face of budget cuts to science and research. It was reported that “a key value added of the Fund was to allow research, dissemination and networking activities to continue despite severe budget cuts”.

### **Newton Fund activities are distinct in their duration of and mechanism for collaboration**

The Newton Fund supports activities over a longer duration compared to others available. This allows for more effective collaboration to take place and offers greater opportunities for rapport-building, mentorship and capacity-building through participation in international conferences and workshops. For example, Newton Advanced Fellowships offered a longer option than the typical one-year schemes which are available in Brazil.

Newton exchanges are described as truly '**two-way**' and **complementary**. While international exchanges traditionally involve researchers from partner countries spending time in the UK, rather than the other way around, there are several examples of the Newton Fund allowing for an extended and repeated presence of UK researchers in partner institutions. This led to improvements in capacity in several ways. It allowed students of the participating institutions to be exposed to international scholarship and different ways of working, as well as directly improving their skills through workshops and technical advice. It also allowed for more effective, in-person dialogue and exchange between the PIs. In Brazil, having the UK counterparts of a research collaboration work and conduct research activities (data collection) from the Brazilian University campus allowed the Brazilian research team to benefit from their technical expertise, and the sharing of new ideas and ways of approaching research. The frequent exchanges and interaction also facilitated the mentorship and peer-to-peer learning aspects.

## **5.7 Conditions for success in capacity-building**

The case studies point to several factors which make capacity-building initiatives successful:

- **Sufficient face time:** Regular interaction is one of the main strengths of the Newton Fund. Several of the case studies highlighted that having face time for the PIs to work together in the same location facilitates knowledge transfer. It provides the opportunity for debate, planning, discussing findings and methodologies, and developing a strong professional relationship. In Egypt, the limited face time between researchers, due to a lack of funds on the part of the local counterpart, reduced the capacity-building potential of one of the projects.
- **Follow-ups and continued contact:** follow-ups and refreshers are necessary to make sure that content is fully understood by participants and applied to their work. Where initiatives for training and professional development are scarce, one-off trainings risk limited knowledge exchange or absorption. Similarly, fostering continued interaction – for instance, through the setting up of new networks – can help lead to peer learning and exchange among training recipients or participants in an activity. This, in turn, can help build their capacity beyond the life of the specific activity. There is currently untapped potential to foster the creation of an alumni network and facilitate learning between different ‘waves’ of Newton participants.

- **In-Country Team:** A key factor in institutional capacity-building is partnership with institutions – both funding and academic – which have limited experience in the management of and participation in large international programmes. Supporting initial cooperation activities can lead to lesson learning and additional investment or organisational changes within the institutions. This can, in turn, build their capacity to engage in international research in the future. The ICT's networks and contextual understanding can be crucial in bringing together the two sides of the partnerships – including proposing local partners previously unknown to UK participants.

**Challenges:**

- Researchers most often participating in Newton initiatives already have existing international networks. There remains potential to reach less well-connected individuals (who might have a greater need for capacity-building initiatives).
- Despite observed improvements in capacity, some gaps remain, as well as high demand for further capacity-building. For instance, particularly successful training programmes, such as DARA, are struggling to meet the demand for more training. Similarly, training provided to TTOs in Mexico was positive, but there are demands for more follow-up training from local partners and participants. Also, capacity gaps remain in the management and administrative structures of funding institutions, often leading to delays.
- It can be difficult to reach small, underfunded institutions which do not have experience in conducting exchanges of this type. In Brazil, there were reports of challenges for researchers to dedicate time to their Newton project, largely due to institutional constraints – resulting in having to conduct Newton-related activities largely during their free time. This can limit their absorption of capacity-building initiatives, as well as reduce others' interest in applying for funding.
- For increases in capacity to lead to collaborative research and innovation outputs, trainings and exchanges are a necessary but not sufficient condition. Engaging with policymakers and university leadership is also necessary if the purpose is to generate a culture and ecosystem of innovation. Often, technical skills are not sufficient: there is also a need to support institutional reforms and simplification of bureaucratic processes, as well as foster a culture of entrepreneurship and of mutual exchange between academia and business.

## 6. Collaborative research

### 6.1 Introduction

This chapter assesses whether and in what way Newton Fund activities effectively supported **collaborative research**. As such, the focus here is primarily on activities under the Research Pillar, though also explores linkages between Research and the People and Translation pillars<sup>19</sup>.

#### **Collaborative research - Fit within the Theory of Change**

Collaborative research is predicated on increased or existing capacity at the individual and institutional level. Under the Research Pillar it can take the form of:

- **Joint research programmes:** joint thematic research calls which involve researchers from institutions in UK and partner countries. The calls are co-launched by UK and overseas delivery partners and jointly assessed (such as the Rice Research Initiative, and Marine Development Feasibility studies).
- **Joint research centres:** typically, virtual joint centres involving research institutes and / or universities from the UK and partner countries which allow for complementarity of skills and expertise while supporting the development of research infrastructure, to tackle issues of shared interest (such as the UK-China *Joint Centre on Probiotic Bacteria* or the *Centre for Research on Avian Diseases*).

We answer the following question using the judgement criteria specified underneath:

- *EQ2.2: Have Newton Fund activities enabled successful research collaborations, and how? What are the benefits?*

We also present our findings for additionality for the Newton Fund in these areas (*EQ1.4*) and identify cross-cutting facilitating factors which contribute to building **successful collaborative research activities with Newton partner countries**.

### 6.2 Summary of findings

**The Newton Fund has generated new international research collaborations that are delivering research outputs in large numbers. The quality of the collaborative research has yet to be evaluated.**

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<sup>19</sup> There are also collaborative programmes linking industry-academia and / or business-business under the Translation Pillar. To avoid overlap and to ensure translation outcomes are covered together, these are dealt with separately, in *Chapter 7*.

Rating	Findings
	<ul style="list-style-type: none"> <li>The Newton Fund has successfully supported and enabled international research that has embedded collaboration from conception to delivery.</li> <li>The Fund has facilitated research collaborations of greater scope and scale than would otherwise have been possible and has been successful in generating collaborations that bring together academics and researchers across different disciplines and areas of interest to research global development challenges through a new lens.</li> </ul>

Activities supported by the Newton Fund under the Research Pillar have enabled research collaborations greater than the sum of its parts, by taking advantage of the (high quality) **complementarity capabilities of the UK and partner countries' institutions and individuals**. There is evidence of collaborations which have been successful in drawing on and combining insights from multiple disciplines to create research outcomes that are context specific and which have practical applications to address global development challenges.

Critical success factors are related to the availability of research funding, but also the funding of workshops and events where new collaborations can be co-developed by individuals and organisations who might not otherwise have met or identified a common interest. **Embedding relation building activities into the delivery of projects is also essential** – to ensure true collaboration and exchange of ideas and knowledge. The **role of the in-country teams is crucial** in facilitating scoping missions, workshops and ‘match making’ potential researcher and institutional collaborations. Award selection processes seek to ensure that the Newton Fund delivers applied research relevant to global development challenges, but more research is needed to ascertain the extent to which this is achieved in practice.

### 6.2.1 Strength of evidence

Rating	Evidence and limitations
	<p>In the absence of comprehensive monitoring data, the evidence base comprises the results from the sample of award holders responding to the online and telephone surveys and examples from the sample of thematic case studies conducted in eight countries.</p> <p>In addition to the limitations relating to a more qualitative approach, our findings here are based on self-reporting, and a specific issue in assessing the benefits of the collaborative approach is that many of the benefits are likely to be intangible or incomplete.</p> <p>Although there are risks that award-holders paint a positive picture of their experience participating in the Newton Fund – for example, if they were interested in applying for additional funds this potential bias was mitigated by informing respondents that all findings would be made anonymous, and, as</p>

	such, not traceable back to them. We have further mitigated the risk of bias through triangulation between different data sources.
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## 6.3 Research collaborations

Successful research collaborations are defined as collaborations that have led to collaborative research outcomes such as a stronger knowledge and research base in relation to development challenges, enhanced relevance of research to decision-making, and the creation of long-term linkages between partner institutions and researchers (in the UK and partner countries). Evidence from the online survey suggests that already there is evidence of research outcomes already (see below)<sup>20</sup>.

Of those who responded to the online survey, **498 (58%) said that they had either submitted or published a peer-reviewed journal article as a result of the Newton funding they had received**; one third of respondents (288) said they had submitted a peer-reviewed journal article and 210 (24%) had had a peer-reviewed journal article published. Of these respondents, there were a number who had submitted or published more than one journal article. **The survey indicated that at least 987 articles had been submitted or published** (as of February 2018 when the survey closed).

A description of where the article had been published, or to where it had been submitted, was given for 571 of these articles. The majority (73%) of these were ‘papers’ that had been submitted or published in an academic journal. Standalone journals accounted for 11%; 3% were conference papers and 10% were classified as ‘upcoming publications’.

In the section below, mechanisms and results of successful Newton Fund collaborations are explored.

### Using complementary capabilities to create a stronger knowledge base in areas of mutual interest

As established in *Chapter 4*, the alignment of activities supported under the Newton Fund with partner country strategies builds collaboration into project design because of the requirement for match funding in the Newton Fund. As such, the selection of research topics is collaborative. As uncovered during the fieldwork conducted for thematic case studies, the scope of research themes and topics is agreed collaboratively and, as such, is based on an awareness of the complementary skills and expertise the UK and partner countries can bring to a project. For example, in the case of the Brazil-UK collaboration on the emergence of the Zika virus in Brazil, the: “*complementarity of skills was central to the project idea itself, [which] brings together experts in molecular virology, immunology, genetics and vaccine development.*”<sup>21</sup>

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<sup>20</sup> Regarding the survey mentioned below, there are discrepancies between the number of respondents who say that they have submitted or published a peer-reviewed journal article and those respondents who then provide the name of the publication in which their article had been published or submitted. The number who responded with the latter information was 359. Regarding the number of articles published according to the survey, the options that respondents could select was ‘four or more’. This means that this number of articles is likely to be an underestimate.

<sup>21</sup> As noted in the Brazil case study report in our case study of Brazil-UK collaboration on the emergence of Zika virus in Brazil.

Leading from the collaborative research selection process, in successful collaborative research, a recurring finding was that the research capitalised on the complementarity of skills, expertise and / or technology to conduct innovative research. Discussions with principal investigators in the UK and partner countries provided insight into the rationale for the selection of partners. They explained that partner selection was driven by a desire to secure access to specific networks, know-how or equipment to deliver ambitious research in new fields and / or in innovative ways, which would not be possible working in isolation.

This was the case in several case studies falling under the Research Pillar. These examples provide insight into the importance of complementarity of skills and expertise for a spectrum of initiatives from a joint research centre to research partnerships, large and small. The examples highlight the value of knowledge / skills for both sides of the partnership, as well as within each country.

- An example of an ongoing large virtual joint research centre is the *Indo-UK Centre for improvement of nitrogen use efficiency in wheat production*. The project involves scientists from five Universities and Institutes in the UK and six in New Delhi, Haryana and the Punjab, the major wheat-producing areas of India. The Indian partners benefit from UK expertise in protocol design, while the UK partners benefit from the opportunity to gather data on the extent of success of different germplasm in different climates.
- A collaboration looking at *Air pollution impacts on cardiopulmonary disease in Beijing*<sup>22</sup> involves five UK and three Chinese institutes. Researchers involved explained the benefits of the complementary expertise of the UK and Chinese partners. The UK side brought expertise in measuring emissions using advanced techniques, while China developed an advanced air quality prediction model which did not exist in the UK. Each side benefits from the expertise of the other and together they are able to tackle the challenge more effectively.
- A research project between FioCruz and the University of Glasgow focusing on *The emergence of Zika virus in Brazil, investigating viral features and host responses to design preventive strategies* illustrates the same point. FioCruz provided the Brazilian strand of the virus – collected from an infected patient – to the UK counterpart. This was genetically mapped using highly specialised equipment for fast genome sequencing in the University of Glasgow’s Centre for Virus Research<sup>23</sup>. The complementarity between the institutions – one providing the virus itself, the other providing the technology necessary to map it – allowed for quick results. These, in turn, allowed other, more advanced research into the Zika virus to take place which proved important because of the urgency brought by the epidemic and the subsequent international focus on it.

This qualitative evidence is supported by the findings from the online survey which asked participants from partner countries about the impact that their UK partners had had on their research projects. Respondents identified the impact on the quality of research as the most important benefit, followed by access to materials and research resources, and help with

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<sup>22</sup> A research component of the Atmospheric Pollution & Human Health in a Developing Megacity (APHH) programme specifically focused on: *An integrated study of exposure science, toxicogenomics and environmental epidemiology*

<sup>23</sup> The UK-based equipment allowed for much quicker results than would have otherwise been possible: access to this equipment allowed for virus mapping in two weeks, compared to the several years sometimes necessary with less advanced technology.

attendance at conferences and training sessions<sup>24</sup>. While the quality of research clearly contributes to a stronger research base (as with access to materials and research resources) it is not as obviously achieved through complementary skills and expertise. However, the value of the collaboration with the UK in boosting the quality can also be seen as a result of the skills and expertise of the UK partners. To understand better how and why quality is improved would need more in depth study.

### **Collaboration supports multidisciplinary research of complex, context specific issues**

Another benefit resulting from successful research collaboration which emerged from case studies was the ability to use collaboration with multiple partners with diverse backgrounds to take a multidisciplinary approach.

Collaboration which built in multiple disciplines and approaches to tackle problems in an integrated way, allowed for a better reflection of some of the challenges in dealing with multi-layered, global problems. In the long-term, this research should be more focused on practical solutions and therefore more relevant to decision-makers. For example, a project in India is gathering new data first hand on local water use and combining it with climate data to create models for the most appropriate techniques for managing water in the Indo-Gangetic Plain. A joint research programme in Brazil looking at the food-water-energy nexus is also combining science with lived experience of development challenges (see box below).

#### **(Re)connect the nexus: Young Brazilians' experiences of and learning about food-water-energy**

This action consists of a joint research programme investigating young people's (10-24 years old) relationship with the food-water-energy nexus in the metropolitan region of Paraiba do Sul river basin (São Paulo State). The collaboration between UNESP, Brazil and the University of Birmingham, UK allowed for a new multi-disciplinary approach through strong complementarity of skills and areas of expertise. The team at UNESP was already conducting research on water, environment and energy – particularly, how to use waste as energy in innovative ways. However, according to respondents, "*what was missing was the human element: understanding how to change behaviours*". This 'human element' was introduced by the UK research team based at Birmingham.

Linked to the benefits arising from complementary skills and expertise of partners, and multi-disciplinarity of approaches, is the specific benefit of involving non-research partners as a means of improving the "real-world" applicability of research. A small scale joint research partnership involving three partners in UK and India provides a case in point: This pilot project entitled "Community-led regeneration" combined historical conservation research with development studies, integrating the local community in proposals for regeneration work (and in the project itself)<sup>25</sup>. It involved two universities and an NGO which acted as an interface between the local community and the research team. The involvement of the NGO was a critical success factor for the collaboration. The NGO set up meetings and interviews with community members which allowed the research to take into account the views of the local community and decision-makers. Information relating to the local community was provided by the NGO partner acting as informant.

<sup>24</sup> Source: Online Survey F2. Base is all Non-UK Newton Fund participants working with international partners and collaborating in projects.

<sup>25</sup> The project looked at potential regeneration projects in the waterfront in Agra.

Taking this one step further, a measure of a successful research collaboration for the Newton Fund, would be to have results with the potential to be applied (note: translation activities are fully covered in the next chapter, while here the focus is on the applicability of research activities). Two examples from the thematic case studies provide evidence of how this is working in practice:

- Work undertaken for a research programme in the Philippines revealed that the Philippine National Malaria Program's current surveillance strategy is flawed. More specifically, the project revealed that 14-17% of malaria cases in one province are not detected using current methods. This finding has the potential to stimulate a change in the national strategy.
- A project funded in China which sought to promote best practice in "Precision Agriculture for Family-farms in China", led to the development of a database on soil and crop information created by project partners. This was made available to Chinese agricultural extension workers who are free to use the data to help them make decisions on water supply. The platform also provides farmers with a digital marketplace connecting them directly with customers, which has the potential to empower farmers and increase their profits.

### **Collaborative activities as relation-building platforms**

The benefits of collaboration discussed above mainly relate to the content of research (in terms of complementarity, multi-disciplinarity) which is enabled by collaborations under the Research Pillar, or the collaborations which support delivery under the Translation Pillar (discussed in Chapter 7). But there are also institutional benefits of collaboration, as noted in our process evaluation completed in 2018, which stated:

*"a major strength of the Newton Fund is the variety of its delivery partners and of the breadth of the science and innovation landscape covered. When the Fund was launched in 2014 many of the delivery partners had not worked together before. Bringing these organisations together is an added value of the Newton Fund."*

The added value arises in the ability of the delivery partners to work together to approach challenges in new, multidisciplinary ways. Indeed, there are good examples of delivery partners working together, including those investigated through our thematic case studies. For example, the work mentioned above focused on air pollutants in Beijing was the result of a joint call between NERC and the MRC looking at air pollution in megacities. The "Research and Innovation Bridges" programme is a collaboration between Innovate UK and RCUK and is the focus of one action funded in Malaysia which falls under the Translation Pillar<sup>26</sup>.

Both are also examples of collaborative approaches which have been applied to multiple countries (i.e. are not country specific). Although not a specific finding of the case studies, an implied benefit is the learning which is enabled by multiple interventions which tackle global challenges (in the case of the APHH programme which has been rolled out in India and China), or institutional learning from repeated collaboration (in the case of Research and Innovation Bridges rolled out in India, Malaysia, and China).

Relation building was also a clear benefit cited by those involved in delivery of projects: telephone survey respondents expressed a keenness to work together again (71% of

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<sup>26</sup> The collaboration is an industry-academia collaboration between Green Data Centers LLP, Universiti Teknologi Malaysia, Dearman Engine Company and Heriot-Watt University. Green Data Centers LLP are the lead for this project.

respondents stated they would be happy to work with their UK/partner country institution again) and the main reason given related to a good partner relationship (40% of those who would be willing to partake in further action gave this reason) or to establish a new relationship (16% of affirmative responses).

### A (potential) springboard for further collaborative research

Another benefit of collaborative research was the ability to secure further research activity based on the development of partnerships between institutions and individuals within them. Data gathered from the telephone survey indicated that over three quarters of respondents (158 or 77%) were of the view that further opportunities had been opened as a result of the Newton Fund, often with the same collaborators (60 respondents). Nearly two-thirds (63%) of telephone survey respondents also stated that new joint ventures, research institutes, or research groups have already been started because of the project.

Evidence gathered during the field visits provides an example of the substantial benefits that can emerge. For example, the research into the Zika virus in Brazil provides an example of successful leveraging of the research partnership to secure further funding based on the credentials and relationships gathered in the process of collaborating: both institutions have set up new partnerships and received additional funding as a result of the Newton Fund activity. The largest is within the EU Horizon 2020 ZIKAlliance, a one million euro fund involving 53 partners worldwide. The project partners also received further funding as part of the MRC Wellcome Trust Zika Rapid Response fund (£32,000 and £36,000).

What was more commonly observed through the case studies was the potential for further collaborative research through applications for further research. This is also a measure of success as it implies the development of successful collaborations with partners who have established a meaningful and useful relationship and would have reason to collaborate again. An example from the Philippines is the PhilRice Research Initiative which acted as a springboard for continued collaboration between the UK and Philippines partner. The team recently applied for GCRF funding with an offshoot project.

## 6.4 UK benefits

While most of the above benefits are true for the UK as well as partners, there are areas where UK benefits are more, or less, pronounced.

### A springboard for further research

Data from the online survey showed UK researchers were slightly more likely than the overseas researchers to say that participating in the Newton Fund had increased their own chances of securing further funding (85% agreement; of which 44% strongly agree) compared to just over 80% agreement for partner countries.

Although this is not necessarily specific to the Research Pillar, qualitative feedback received through the case studies suggests that the connections established through the Newton Fund made it easier to reach out to contacts and to find appropriate partners. Examples from Research Pillar projects, investigated through case studies, demonstrate the **benefits to UK science** of improved visibility and positioning for collaboration in priority areas, including to drive areas for collaboration. For example:

- The UK has recently been able to generate interest from within the Brazilian government for some of its priority areas, such as anti-microbial resistance. This was a topic in which the Brazilian government did not express initial interest, and which has grown to become an important cross-agency policy and research topic in the last year.
- The Newton Fund created an opportunity to advance UK science by giving AHRC access to Egypt's rich heritage and expertise. A project covered in our case studies – as part of the AHRC's pool of projects on cultural heritage with the Newton Fund – responded to its desire to cooperate with Egypt and has led to further cooperation. The AHRC is keen to build on this first phase of activity to bid for further funding within the Newton Fund to launch a call for larger research projects.

### **Growing and developing relationships and networks**

Online survey data shows the importance of the Newton Fund in strengthening pre-existing relationships for UK researchers: those responding to the survey were more likely than those from partner countries to say the collaboration had strengthened their previous relationships (90% agreement; of which 62% strongly agree) compared to under 80% agreement for partner countries.

As identified in the India case study research, the added value of the Newton-Bhabha Fund has often been in building on significant pre-existing collaboration but using the Newton-Bhabha Fund to scale up and drive forward activity to the next stages. In two cases investigated as case studies, previous work was crucial in laying the foundations for subsequent, more ambitious work. The benefit of the Newton-Bhabha Fund was in providing a (relatively) flexible framework for driving collaborations in applied research forward or extending the reach of UK-Indian partnerships.

Similarly, leveraging pre-existing personal and / or institutional connections to develop formal, and / or larger collaborative research partnerships and / or new collaborations was evident in a case study in China. Institutions noted that the Newton Fund had helped them either establish completely new institutional links with participating research institutions (in their own country or with their UK/Chinese partner) or to cement a personal relationship into a formal collaboration.

### **Access to research material (and fieldwork opportunity) in areas of UK interest**

There was anecdotal evidence from field visits that preferences for research themes often come from UK delivery partners. While ultimately research areas are mutually agreed (in the country strategies), the UK is able to exert some influence on the focus and scope of research in areas of particular interest to UK delivery partners. Indeed, UK researchers engaging in collaborative research with partner countries gain access to research material (and fieldwork opportunities) which further UK science and innovation by allowing for first-hand research in these areas of interest. This finding was corroborated by the results of the online survey, where UK participants tended to rank access to materials and research resources as the most important impact their overseas partners had had on their research projects (nearly 60% of responses selected this option as having the “biggest” impact on their research)<sup>27</sup>. It is further evidenced in examples from case studies:

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<sup>27</sup> 57% of 161 respondents selected this (alternatives were: “The international partner helped improve the quality of my research”; “The International partner helped improve the quality of my research outputs (e.g. journal papers editorial book chapters)”; and “My UK-based partner helped me attend conferences and training sessions”).  
(Source: Online Survey F2)

- In the Philippines, the report on *Developing rice resources for resilience to climate change and mitigation of carbon emissions*, has opened up the opportunity to enhance cereal research in the UK through access to rice with the relative simplicity of transferring information between species.
- For the UK side of the project, working on “LIFE”<sup>28</sup> opened access to the Egyptian forensic psychiatry field. This not only allows expansion of the scope of expertise to another country, but it is a chance to gain original data for future publications. In particular, working in Egypt allowed for a much quicker data collection process than would have been possible in the UK due to differences in administrative procedures.
- In one project in South Africa, the main benefit for the UK principal investigator and institution was reported to be access to data from patient groups (not available in the UK).

## 6.5 Additionality and added value of the Newton Fund in collaborative research

Data from the online survey showed that while 60% of non-UK respondents believe they would have partnerships with UK institutions had they not received Newton funding<sup>29</sup>, 47% believed the relationships forged would not be as good as they are now (and as many as 31% of respondents thought that without the funding, there would be no partnership with any UK organisation). Examining some of the benefits of the Newton Fund (as opposed to other UK or international funding) shows the importance of the following:

### **Collaboration as an intrinsic part of research selection process**

An added value of the Newton Fund was the collaborative approach to design of research. The funding model for Newton activities to some extent necessitates a collaborative approach to research: the matched funding element creates a need to ensure both the UK and partner countries co-design the research. With both governments and institutions investing money and/or resources, calls for proposals are jointly issued, assessed by both sides, and then rolled out in partnership. Taking the experience gleaned from Brazil, partners commented that the preferences for research themes usually come from UK partners, but were then adapted to the Brazilian context. The contribution of partners was, overall, described as one of Newton’s main strengths compared to other initiatives. By comparison, Horizon 2020, despite launching many calls, does not ask international partners for their contribution in design or thematic preference. Similarly, the inclusive approach was also deemed a strength by funding partners consulted as part of the research for case studies in India:

*“What is qualitatively different with the Newton-Bhabha Fund, and in the case of INEW30, is the ability to define priorities together...”*

The importance and value of collaboration was also highlighted in telephone survey results. Asked what made the Newton Fund distinctive, the most common response for telephone respondents referred to increased collaboration (74 or 39% of respondents). Similarly,

<sup>28</sup> LIFE is the abbreviation used for the project on: Long Term Incarcerated Patients in Forensic Settings: Role of Research in Socioeconomic Enhancement

<sup>29</sup> 60% of the 383 respondents agreed with the statement that if the funding had not been provided, many of the non-UK institutions would continue to partner with UK institutions.

<sup>30</sup> Project on: “Indo-UK Centre for Improvement of Nitrogen use Efficiency in Wheat”

telephone survey respondents were asked about additional or unexpected benefits and the most common reply (where one was given) was in relation to collaboration or the size of networks created (response given by 67 or 33% of respondents).

### **Newton funding facilitates new, interdisciplinary research at a large scale**

Survey data show the importance of the Newton Fund in enabling new research. Overall, only 6% of respondents thought they would have carried out all their research activities if they had not received Newton funding. As many as 94% said the funding had enabled additional research, with nearly half of respondents (47%) reporting their research activities relied on Newton funding.

The survey data showed evidence of displacement, because without Newton funding, nearly half of all participants would have applied to other funders to complete their activities in the same field (although this may / may not have been successful and is unlikely to have used the same collaborative approach or focused on Newton Fund/ODA priorities in the same way). Overall, 46% of participants would probably have looked for other funders to undertake their research activities in the absence of the Newton Fund. UK participants were less likely than partner country participants to say that they would have applied for other funding<sup>31</sup>.

More detailed insights gathered from the case studies showed that oftentimes the availability of funding from the Newton Fund allowed researchers to gain access to funding not typically available: for instance, some organisations referred to the fact that securing multi-year funding from local funders was challenging and had been enabled through the Newton Fund partnership which provided an international lever to set this up more quickly and easily. An example for how this played out in South Africa is given in the box below but this was also the case in several other countries such as India, Philippines and Malaysia.

#### **Newton Fund contribution to Dara programme in South Africa**

The Newton Fund support and action aims to implement a human capital development programme in radio astronomy in Southern Africa to help improve human capacity and drive economic growth through up-skilling.

At the time of the proposal, South Africa had recently won (in 2011) the bid to host the €650M Square Kilometre Array 2 (SKA). As part of this, South Africa will host core parts of the infrastructure and act as the African headquarters. The SKA will eventually consist of a network of several thousand radio telescopes that will cover eight partner countries in Southern Africa.

There is however very little astronomy activity in these partner countries at present so the DARA programme will help to develop some of the human capital and high-tech skills needed for the future. The large Newton contribution to DARA (almost £4 million) and the speed that funding was secured has greatly increased the reach and scale of the project as well as the impact and political profile. While national funding is also available in theory, it requires more time and administration, with multi-year funding often difficult to secure.

As mentioned above, the Newton Fund provides a funding vehicle for holistic, interdisciplinary research which is not available elsewhere. The case study on UK-Philippines partnership for

<sup>31</sup> Specifically 26% of UK participants (n=161) said they “strongly disagreed” that they would apply for other funding vs 9% for other countries (n=383) Source: *Online Survey E3 and F3*.

Enhanced Surveillance for Control and Elimination of Malaria in the Philippines (ENSURE) is a good example of how this worked in practice. Although the UK and Philippines teams had collaborated previously, the ENSURE project in its current, interdisciplinary form was unlikely to have taken place without the Newton Fund. Both teams explained that the available funds for this type of research is limited, as the Philippine Department of Health's funding for projects primarily prioritises service delivery. To achieve the scope which the ENSURE project currently has, the team would likely have had to rely on several smaller grants to fund specific parts of the project, which the team explained would have come at the expense of the holistic, integrated approach which now characterises ENSURE.

### Potential for multinational dimension and/or cross pollination between countries

Related to the above in terms of the scale of work enabled by the Newton Fund is the potential for multinational research and / or cross pollination where research tackles global themes across multiple countries. An example from the Philippines of the additionality of the Newton Fund in this regard is taken from the case study report from the project on Developing Rice Resources for Resilience to Climate Change and Mitigation of Carbon Emissions, below:

*“The impact on the PCC [Philippine Carabao Centre<sup>32</sup>] and [the] PhilRice [Institute] has been substantial, as it has enabled successful research collaborations at the international, regional national level. The Newton Fund was described as “instrumental” by PhilRice members in allowing the PCC and PhilRice to partner with the UK and Vietnam and was also described positively for expanding the scope of their research areas and introducing new methods ....”*

Similarly, the potential impact of a programme run in China on Atmospheric Pollution and Human Health in a Chinese Megacity, and of one project supported within it<sup>33</sup>, extends beyond China. As presented in the case study report, participating researchers explained the work is applicable and relevant in other countries with high levels of pollution. Teams are already collaborating to share lessons and inform each other's projects as relevant.

## 6.6 Conditions for success in collaborative results

There are several factors which contribute to making collaborative research more or less successful within the Newton Fund:

- **Availability of funding:** The availability of funding to initiate and deliver collaborative research is clearly a precursor to successful research which – given the current funding landscape (whereby Newton funding ceases in 2021) is important to highlight. This is illustrated by the feedback received during the fieldwork in India, where one delivery partner explained how the funding available through the Newton Fund has allowed India and the UK to take up latent opportunities for collaboration: *“The journey with the Newton Fund has been transformative... The only thing that was holding us back was that UK government was not committing funds for bilateral collaboration with India.”* Evidence from the online survey further confirms this: the overseas researchers were also asked how important the funding had been to connect with the UK researchers in their network. 72% said it was important; 37% said it was vital.

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<sup>32</sup> This is an agency of the Department of Agriculture (<http://www.pcc.gov.ph/>)

<sup>33</sup> Air Pollution Impacts on Cardiopulmonary Disease in Beijing: An integrated study of Exposure Science, Toxicogenomics and Environmental Epidemiology

- Structuring research to allow for relation building: One of the benefits of collaborative research is that it serves as an entry point for relation building and to expand networks. Designing research programmes or activities to allow for relation building was important to build the collaborative element and prevent siloed working, especially when there are large research networks involved. For example, building in regular meetings with partners to check in with progress and realign or adjust activities, and share feedback. Where projects are built around broader thematic collaboration between institutions, this can provide a strong backdrop to facilitate the development of relationships and multiple opportunities to meet, thereby creating a more sustainable structure for collaboration. A specific example from India is a useful illustration of this, but this was a common finding for the larger scale thematic calls which Newton Fund supports. The case study project (on systems for water management under uncertainty in the Indo-Gangetic Plain) emerged from a previous collaboration between the UK and India, and is now part of a broader research group: the India-UK Water Centre<sup>34</sup>. The Centre aims to establish a platform for, and legacy of, long-term partnerships and dialogue between Indian and UK water researchers (and water policy-makers and water businesses). Sitting within this broader research group allows the parties involved to network with researchers in their field. The case study in the Philippines on developing rice resources for resilience to climate change and mitigation of carbon emissions shows how relation-building can occur at a multilateral level, with partners brought together from the UK, the Philippines and Vietnam.
- Work of the in-country team: The work of the Newton in-country team in facilitating missions, scientific workshops and finding high quality delivery partners is critical to success, especially in cases where there were no pre-existing connections or relationships. Their local knowledge, insight and oversight of country activities, and ability to provide tailored support on a case-by-case basis helps ensure that collaboration is as smooth as it can be.
- Capacity of researchers and institutions: successful research collaborations require sufficient capacity of researchers and institutions (as covered in *Chapter 5* and not duplicated here).

### Challenges:

- **Capacity constraints in partner countries:** There were concerns about the limited institutional (administrative) capacity of some delivery partners which can also lead to delays / jeopardise delivery when delivery is particularly time sensitive.
- **The limitations of separate parallel research:** A limitation identified in a small number of projects was that it was sometimes logically simpler for parallel research conducted by UK and partner institutes on specific components and for the partners to come together at set points in the project to share findings and for them to be taken forward using specific skills and expertise of a partner. The limitation of this approach is that it doesn't lead to the same outcomes in terms of building long term relations between institutions and individual researchers. It produces parallel research rather than truly collaborative research.

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<sup>34</sup> This is a virtual joint centre established in 2016 and funded by the Indian Ministry of Earth Sciences (MoES) and the UK's Natural Environment Research Council (NERC).

- **Administrative challenges:** Obtaining sufficient funding and administrative processes were the factors which proved most difficult while undertaking research (according to data from the online survey). Generally, it seems that obtaining sufficient funding and the administrative processes of home institutions are the two factors causing difficulties in pursuing joint funded research. In particular, Malaysian award holders found it difficult to gain access to funding (with 41% of Malaysian respondents reporting this). With regards to the administrative processes of their own institution, Colombia (41%) Egypt (37%), Kazakhstan (52%) and Philippines (50%) all faced notable obstructions; these are dealt with in detail under *Chapter 8* (assessing processes).
- Research is necessary but not sufficient: While successful research collaborations are important, they are not an end in themselves, but part of a longer-term objective to provide solutions to development challenges. This requires them to lead to products, goods and services or policy change. The extent to which research outcomes of the Newton Fund have practical application is worthy of more detailed investigation beyond the sample of projects reviewed for the evaluation.

## 7. Translation

### 7.1 Introduction

This chapter assesses whether and in what way Newton Fund activities effectively contributed to creating collaborative solutions to development challenges and strengthening innovation systems, and the development of innovation partnerships and challenge funds to find innovative solutions to development issues. As such, the focus here is primarily (but not exclusively) on activities under the Translation Pillar, including how they relate to the outputs of the People and Research Pillars in the Theory of Change, regardless of whether these outputs were generated via the Newton Fund or were exhibited independently.

#### Translation - Fit within the Theory of Change

The aim of the Translation Pillar is to support and bring together the expertise of researchers in partner countries and in the UK through the development of collaborations between academia and industry, or businesses to businesses, to ensure that innovative research has a route to the policy arena or the market (via commercialisation). Sometimes this involves capacity building as a core component of the Translation activities. As such, it can benefit from activities and outcomes undertaken under the other Pillars. For example, based on increased or existing capacity at the individual and institutional level, the Newton Fund supports collaborative solutions to development challenges and strengthened innovation structures in partner countries as well as increased links between academia and business to build research and innovation bridges. This includes increased training and awareness of commercialisation and innovation.

The primary activities supported under the Translation Pillar are standalone programmes under the following three categories:

- Capacity building for innovation, applied research and commercialisation, such as the *Leaders in Innovation Fellowships Programme*
- Collaborative programmes, Industry-Academia and Business-Business, such as the *Higher Education Partnerships Programme (HEP)*, *Collaborative Industrial R&D and Institutional Links*; and
- Activities to establish and strengthen institutional links and support exchange of expertise, such as *Institutional partnerships*.

The Translation Pillar reflects in part the end goal of the other two Pillars (Research and People), as the collaborations, training and outputs of these Pillars are in the long-term intended to translate to policies or innovations which contribute to development challenges.

In this chapter we answer the following questions using the judgement criteria specified beneath each question:

- EQ2.3: Have activities under the Translation Pillar created collaborative solutions to development challenges and strengthened innovation systems?

Having answered this question, we present our findings for additionality for the Newton Fund in these areas (*EQ1.4*). Finally, we identify cross-cutting facilitating factors which contribute to building **successful innovation systems and collaborative development solutions**, as well as drawing lessons which can help inform contribution to these objectives in the future.

## 7.2 Summary of findings

**Translation activities have created collaborative solutions aimed at tackling development challenges – with some results observed in the early years of the Fund's operation**

Rating	Findings
GA	<p>Many Translation activities remain in the early stages of delivery and are not expected to deliver measurable results in the short to medium term.</p> <p>However, there is already evidence of translation outcomes in the form of new start-up companies, licencing agreements and new intellectual property being created. There are also examples of Newton Fund research informing policy changes at national and local levels and capacity building in this field.</p>

The early years of the Newton Fund focussed on People pillar activities, being those that were relatively faster and easier to launch. Translation projects have required more time to develop and to implement, and as a result there are fewer examples of outcomes to report at this mid-point of the Fund. This is consistent with the Theory of Change for the Fund with a shared understanding that **such outcomes (and impacts) will take longer to come to fruition – and some may not be possible to fully observe even within the lifetime of the Fund**. Nevertheless, some outcomes have been observed, that include partnerships with the private sector that have led to the creation of new enterprises and licencing, and activities that have led to policy change at a national or regional level within partner countries.

**Ensuring the transferability of research findings into commercialisation or policymaking is critical to success.** Those activities which have been successful are those which have considered and planned for transferability from the outset, and those which have shared and taken advantage of unique specialisms, facilities or resources of each of the partners in the collaboration. **The added value of the Newton Fund is in creating and supporting these new collaborations which deliver more than the sum of the individual partners could have achieved in isolation.** Challenges remain, often related to government or institutional funding mechanisms and bureaucratic processes which can hinder the progress of translation activities in partner countries.

## 7.3 Strength of Evidence

Rating	Evidence and limitations
	<ul style="list-style-type: none"> <li>In the absence of comprehensive monitoring data, the evidence base comprises the results from the sample of award holders responding to the online and telephone surveys<sup>35</sup> and examples from the sample of thematic case studies conducted in eight countries from the Translation Pillar. The telephone survey explored translation in more detail than the online survey was able to.</li> <li>In addition to the limitations relating to a more qualitative approach, our findings here are based on self-reporting, and a specific issue in assessing the benefits of the collaborative approach is that many of the benefits are likely to be intangible or incomplete.</li> <li>The main limitation in the evidence base at this mid-term stage is that it is often too early for collaborative solutions to be evidenced.</li> </ul>

## 7.4 Innovation systems and collaboration with industry

This section focuses on the evaluation question:

*EQ2.3: “Have activities under the Translation Pillar created collaborative solutions to development challenges and strengthened innovation systems?”.*

The relatively early stage of implementation of translation activities (compared to the timeframe in which outcomes and impacts are expected to be observed) limits the extent to which the collaborative solutions themselves can be analysed at this mid-term stage. The focus has instead been on the Translation Pillar output of ‘new partnerships established, and existing partnerships strengthened,’ as a review of collaborations under the Newton Fund to inform an assessment of ‘direction of travel’ towards these longer-term goals.

This section looks at partnerships directly established under Newton projects with the specific intention of creating formal links between institutions, and new / strengthened collaborations **which have occurred as a spillover effect of collaborative work facilitated by the Newton Fund.**

‘Collaborations’ under the Translation Pillar include collaborations between and across academic/ research organisations, business, NGOs and governments. Development challenges which these collaborations aim to generate solutions can refer to challenges

<sup>35</sup> Respondents were asked for details on a variety of outputs (such as publications, patents and new joint ventures), interaction with policy makers, profile of the issue they worked upon on the global stage and changes in national policy (future or past). Answers to themed areas of influence questions are also reviewed within this chapter, as well as several questions which go into depth about access to policy makers, new or strengthened international partnerships and joint-ventures or spin outs resulting from Fund activities.

experienced at the both national and international levels, ranging from economic development, to poverty reduction, environmental sustainability and gender equality among others.

The second main aspect of this evaluation question, ‘strengthened innovation systems’, in large part builds upon the analysis of collaborative work as well as the ease of processes allowing research or products through development, to market application or public use. There are several definitions used for innovation systems. Metcalfe’s 1995 definition of a national innovation system (see below) captures many of the aims of the Translation Pillar projects conducted under the Newton Fund (such as Institutional links and the Leaders in Innovation Fellowship programme, which are explored in greater detail later in this chapter).

“.. that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies.” (Metcalfe, 1995)

However, it is not just at the national level of the UK or partner countries that innovation systems can be strengthened. International innovation systems are also of interest, and it is here that more recent definitions by Hwang and Horowitz become relevant, which emphasises a breakdown of barriers and defines an innovation system as “*a human social network that behaves like a sociobiological system, where people have developed patterns of behaviour that minimize transaction costs caused by social barriers resulting from geography, lack of trust, differences in language and culture, and inefficient social networks.*”<sup>36</sup>

### New collaborations and collaborative solutions to development challenges have been created

**New collaborations** are numerous under the Newton Fund. An example of an activity specifically designed to generate collaborations in the Translation space is ‘Institutional Links’. Between 2015 and 2017, Newton Fund Institutional Links had 970 researchers participating, £46 million raised in leveraged funding and over 20% of projects influencing national policy (see box below).

#### Institutional links

Institutional Links provides grants for the development of research and innovation collaborations between the UK and partner countries. The British Council runs Institutional Links in partnership with research and higher education institutions.

Institutional Links grants facilitate research that tackles local development challenges such as extreme weather conditions, access to affordable health care, food and energy security. Institutional Links grants range from £30,000 to £300,000 over two to three years. Research-related costs are covered, as well as the exchange of researchers, students and industry staff, including from small and medium-sized enterprises and not-for-profit organisations. The costs of organising meetings, seminars and training and other activities to establish and strengthen collaborative links.

<sup>36</sup> Hwang and Horowitz, 2012: “The Rainforest: The Secret to Building the Next Silicon Valley”

Among the award holders surveyed, 60% indicated that new international partnerships were created as a result of their Newton funding. Among these, 21% referred to their sole Newton partner, 29% to new partnerships with multiple countries, and 34% to multiple partners from within their Newton partner country.

New collaborations and subsequent collaborative solutions can also be examined in cases where industry partners become involved at later stages of projects or new ventures are pursued because of Newton Fund activity. The online survey found that to a limited extent **Newton funding had enabled certain outputs to be produced, including intellectual property (IP)**. Of the 862 respondents to the online survey, 4% described “a joint venture agreement reached” as a result of Newton activities, and 2% a ‘spin-out or start-up company/enterprise formed to exploit IP’. 73 (8%) respondents had developed software or a technical product with the funding they had received. Of those, nearly half (49%) developed software (for example, ‘new codes for analysing earthquake locations...and seismological data’). Of the technical products developed (26), these tended to have a medical/scientific purpose (12) or relate to an agricultural product (6). Examples include ‘personalised implants, medical devices and bio models for pre-operative planning and treatments of bone tumours’ (Vietnam) and ‘preclinical development of a new drug for ischaemia-reperfusion injury<sup>37</sup>’ (UK).

A few **examples of start-ups or spin-out companies generated as part of Newton Fund projects were provided by the small number of private sector respondents to the telephone survey**. Among the 20 such respondents, two indicated that they had future aspirations for starting a company, and a further three stated that this had already occurred (for example, a Chilean project where the respondent had set up their own company creating food-supplements as a result of their Newton funding generating a food supplement for the aquaculture industry to decrease mortalities from pathogens.

Joint ventures, research institutes, and research groups were a relatively common output from Newton Fund projects, particularly within the respondents to the telephone survey: 63% responded yes (n=202). More relevant here, 5% described an industry partnership being formed and 9% a joint venture. The large number of partnerships formed as opposed to formalised joint ventures and research groups may simply be reflective of the early stage of collaboration. Some examples of industry partnerships described initiatives and efforts clearly aligned with the Translation Pillar, including one collaboration with private partners in India with plans to submit a joint proposal to the government of India.

Examples of spin-out and joint-ventures as a result are evidenced in the case studies. For example, one Filipino project which explores the alternative applications of rice has not only increased collaboration between two Filipino bodies (the Philippine Carabao Centre and PhilRice) but provided the former with more opportunities for collaborating as they were approved by companies interested in commercialising the PCC’s adoption method turning rice straw into useable feed (see box below).

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<sup>37</sup> “Ischaemia-reperfusion injury” is a type of inflammation or tissue damage that occurs when blood circulation is restored (“reperfusion”) after a period of restricted blood supply (“ischaemia”).

## **Developing rice resources for resilience to climate change and mitigation of carbon emissions**

The collaboration between PhilRice and the Philippine Carabao Centre (PCC) aims to improve the quality and resilience of rice production, for two reasons:

- To discourage farmers from burning rice straw after they cultivate rice yields, which releases high levels of carbon dioxide, negatively impacting the environment. This is to be achieved by the production of rice straw which is low in silica and high in digestibility. This means it can then be used as animal feed or as biomass rather than being burnt.
- To develop rice straw which is resistant to adverse climates. This is to be achieved through genome studies.

Working in partnership with the University of York and the Vietnam Field Crops Research Institute, the project is expected to increase economic development through a reduction in the environmental harm that is caused by the burning of rice straw. Also, being able to use rice straw as animal feed – or selling it for biomass – should save farmers' money.

Although it is too early to see the impacts resulting from a reduction in the amount of rice straw being burnt, the impact of using excess rice straw for animal feed is clearer. The PCC, who are collecting the rice straw, have already been approached by another private group asking about how to commercialise the collection of excess rice straw.

The impact of the Newton Fund on the PCC and PhilRice has been substantial and has enabled successful research collaborations, both regionally and internationally. The Newton Fund has allowed the introduction of new genome studies into their research, widening its scope.

The project has been highlighted as an example of best practice in Vietnam and was

The evidence from the telephone survey suggest there was a **high level of achievement in relation to collaborative solutions to development challenges**, with 89% of telephone survey respondents agreeing that their project had 'created collaborative solutions to development challenges' or expected to in the future. Though there are limitations due to the survey's nature of self-identification, this is a positive indication of alignment with the Translation Pillar's aim under this evaluation question. When those who agreed with the statement were asked to expand, 48% gave no further detail than their Newton project or a new project created as a result of a collaboration which created solutions to developmental problems, and 18% stated they were expecting an impact in the future. Product outputs and policy solutions comprised 12% and 5% of responses respectively, a smaller number which again can likely be attributed to the timeline of projects so far (as reflected in the 18% response rate for 'expect future impact').

Nevertheless, accounts of these outputs highlight the Translation effects of several Newton Fund projects even at this stage, such as one Mexico-UK project which emphasised transfer of research methodology to organisations focusing on women and children in the borderlands between Mexico and the United States. This project created an app and hosted a conference on women and children under risk (which aimed to influence policymakers within city councils and some manufacturing organisations and acted as a platform to discuss and modify recruitment for young woman at risk in industrial plants). Other examples highlighted in the

telephone survey of direct collaborative solutions with clear translation into product outputs include a spin-out company partnering with laboratories to create food supplements in Chile and the development of antimicrobial materials in Colombia.

As a result of Newton funding there have been several cases of collaboration with and between businesses, either during the project itself or at later stages when businesses are interested in research outputs. The telephone survey found 30% of respondents indicated they were either in the private sector themselves or had private sector involvement in their collaboration.

### **Strengthened Innovation systems through training and systems and innovations policy**

The second key aspect of the evaluation question focuses on strengthened innovation systems.

Several Translation and People Pillar projects emphasise training researchers (be they academic or industrial) on the development of processes and goods which can be commercialised. Whilst training clearly feeds into the capacity building output within the People Pillar, the Theory of Change describes how capacity building for innovation, applied research and commercialisation is a key activity under the Translation Pillar. The training itself will not produce a Translation output, but will support future Translation activity, and contribute to the outputs and outcomes under the Translation Pillar.

The online survey asked respondents if they had received training or support related to commercialisation and innovation during their most recent Newton Fund activity. Of the 862 respondents, only 6% (50) respondents stated they had received such training or support. To gain further insight into this strand of Translation Pillar activity, the thematic case studies investigated the innovation training and support programme with the largest scope, the Leaders in Innovation Fellowship programme (which is described further in the box below). This project is one of the linchpins of the Translation Pillar and operates in all Newton Fund partner countries except for Indonesia, Jordan, Kenya, Kazakhstan, and Peru. Another important example is the Global Innovation Policy Accelerator (which was not the subject of a case study but is also summarised below).

### **The LIF Programme**

One of the programmes the Royal Academy of Engineering (RAEng) is delivering as part of the Newton Fund is the Leaders in Innovation Fellowship (LIF). The primary objective of the LIF programme is to build the capacity of participants for entrepreneurship and commercialisation of their research. The programme is aimed at researchers within the Newton Fund partner countries, who are at the point of developing a business proposition for their innovation.

The RAEng partners with different relevant bodies involved in Science, Technology and Innovation (STI) in other partner countries such as government departments and aims to create an international network of STI entrepreneurs.

During a residential programme in the UK, cohorts from these countries benefit from a focussed period of training in entrepreneurship, as well as time and access to expert coaches to help them develop pitch presentations and executive summaries of their business plans. After Fellows return, they continue to receive remote coaching support over several months in a follow-on programme.

### **The Global Innovation Policy Accelerator**

Complex societal challenges don't fit neatly within the boundaries of any one government department's responsibilities; nor do the questions posed by the innovations needed to solve them. Policy-makers need to understand both how to create the conditions for those innovations to come into being and how to work collaboratively to ensure the innovations can come to market without falling foul of a regulatory environment which pre-dates them.

Innovate UK's Global Innovation Policy Accelerator is a senior executive development programme seeking to build a global network of innovation policy entrepreneurs. It is an intense programme that gives partner country policy-makers the opportunity to engage with the best of UK innovation policy expertise and capability. It is jointly funded by the UK, through Innovate UK, and country partners, and is delivered by a Nesta-led consortium of UK organisations and partners.

The programme combines two 1-week long immersive visits to the UK, 6 months apart, with in-country application. The teams comprising of policy-makers build their capability to design and test new types of innovation policies and programmes, each developing a collaborative project to try to solve some of the key challenges facing their country's innovation ecosystem. The teams on the programmes are generally mixed, coming from different ministries, agencies and, sometimes, other organisations, thus promoting more joining up across the system. The Programme closes with a Final Conference, jointly organised by the UK and partner country governments, in which teams are given an opportunity to present their projects to a wider stakeholder audience, and celebrate their achievements through the Programme.

Through programmes like the Policy Accelerator, the shared challenges can be identified, and better and more effective programmes for boosting innovation collaborations can be developed and tested.

Another example of this is the Technology Transfer Best Practice and Skills Development Training for Practitioners. Although formally a People Pillar project, this initiative is highly relevant to Translation, providing training in areas such as knowledge exchange and commercialisation, Intellectual Property (IP) policy as well as societal and ethical considerations in innovation management. The initiative is similar in areas to the LIF programme. Our survey of the 28 training participants, revealed knowledge enhancements in all areas covered by the training, the largest being in knowledge exchange and commercialisation, licensing and business models. DARA in South Africa operates in a similar manner and is described further in the box below.

### **Development in Africa with Radio Astronomy**

This is a three-tiered training programme in radio astronomy for human capital development in several African countries in partnership with South Africa. DARA is delivered through a basic training programme for ten students per year per country, advanced training via MSc and PhD bursaries at member universities in the UK and South Africa and an outreach programme. This action targets students in Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia, South Africa and Zambia.

This action aims to develop high tech skills using radio astronomy in several African countries. Radio astronomy encompasses all the science, technology, engineering and mathematics (STEM) skills that underpin the emergence of a strong economy. It aims to inspire and train young people to engage with these skills. The long-term goal is for DARA to create sustainable radio astronomy research groups in the partner countries, able to run, maintain, develop and exploit their local dish, the African Very Long Baseline Interferometry Network (AVN) and eventually the Square Kilometer Array.

Whilst training at the individual level is significant, to ensure lasting and significant strengthening of innovation systems requires **changes in innovation system infrastructure as well as changes in policy which encourage and support innovation** (at the institutional and national level). Again, the LIF programme is significant in this regard, as the role of Technology Transfer Officers is to apply and teach what they learn via the programme at their own institutions. There is limited evidence to date of such changes being implemented, though the Filipino case study highlights that one Fellow managed to change policy at their university to give academics support and time off academic duties to encourage the development and possible commercialisation of their research project.

The telephone and online surveys did not directly ask if there had been any institutional change, but participants were asked if any policy statements or issues papers were produced as a result of Newton Fund activities. Of the 862 respondents, 4% (38) described these being produced. For example, a Turkish respondent produced a policy paper for the Turkish Patent and Trademark Office about the draft law of its Intellectual Property Code. Another UK respondent described a document which aligned with international innovation system development in the form of a paper on the importance of interdisciplinary approaches to researching water and food security which has since formed the basis for the case for international collaborative research proposals on the topic. Again, the results of such efforts in influencing downstream policy change will only be observable in the medium to long term.

## 7.5 Translation benefits for UK Partners

The bilateral nature of the Newton Fund which distinguishes it from other development initiatives also brings into focus another relevant judgement criteria, specifically: “*the extent to which UK science and innovation opportunities opened up through these translation activities*”

Many of the UK benefits of the Fund are highlighted in previous chapters (i.e. new collaborations raise the profile of the UK and improve its access to new resources and expertise). However, there are also relevant Translation Pillar benefits to the UK that are smaller in number and harder to quantify in the current timeframe. The benefits mimic those observed in the partner countries.

### **Strengthening of collaboration with industry and innovation systems**

A review of projects closely evaluated within country case studies shows several instances of the UK’s reputation and positioning as an STI collaborator with partner countries increasing. For example, in Egypt respondents noted that the work under an education project with the UK had helped to distinguish the UK from other funders (such as France and Germany), raising its profile and positioning it as ‘partner of choice’ for Science and Innovation cooperation in the Egyptian higher education sector. Such sentiments were mirrored in the Philippines by government department stakeholders, who explained that the Newton Fund provided them with the first formal opportunity to collaborate with the UK on STI initiatives and improving awareness of its relevancy to Philippines policy and research. This has enabled a continued relationship between the UK Met Office and Filipino Department of Science and Technology bodies on satellite mapping.

The UK has also benefited from the Newton Fund via spin-outs and joint ventures, as reflected in one British online survey respondent’s description that the Newton activity had introduced them to some commercial partners in their South American partner country, expressing infant plans to market their equipment via one of these newly introduced companies to others within the country as well as academics.

### **Interaction with policy makers occurs but is not a strength for UK partners**

UK award holders were less likely than their international partners to feel that the Newton Fund had increased their contact with policy-makers. 31% of UK respondents to the online survey agreed or strongly agreed with the statement that collaboration with their partner country had allowed them to interact more with UK policy-makers to implement issues they are researching. No firm examples of exerting influence on UK policy were observed – though this is not a stated goal of the Newton Fund.

## 7.6 Additionality and added value of Translation activities

The additionality of the Newton Fund in translation activities is high, though there is a smaller evidence base on which to draw such a conclusion as translation activities have required more time to develop and to implement (partly because of their novel nature). As a result, there are fewer examples of the additionality and added value of these activities at this mid-point of the Fund’s lifetime, but this also speaks to the additionality: these types of activities were not happening anyway, there was no easy “off the shelf” model for many of these types of activities. The UK partners have created new programmes and are working in new countries because of the opportunities the Newton Fund has provided.

## 7.7 Conditions for success in Translation activities

There are a number of factors which contribute to making translation activities more or less successful:

- **Planning for transferability and to maintain momentum:** Several Translation activities train individuals and operate placement systems. The LIF programme, for example, has a different round of fellows every year and much of the project builds up to the time in the UK. After a noticeable drop off in response rates in the first few years and based on feedback from fellows, the programme adjusted to maintain structure around the programme after the UK placement part was completed, and to maintain momentum on the lessons learnt. Establishing clear plans or trajectory for research outputs or collaborations after project end is critical.
- **Sharing of resources and expertise:** Initiatives where both the country partner and the UK partner were able to share and take advantage of the unique specialisms, facilities or resources of each partner were often successful. One third of telephone survey respondents with a partner in the private sector stated the aim of the partner was to commercialise their project, indicating separate roles of each partner and therefore a need for resource sharing for commercialisation to be a success. A further 15% of partners explicitly stated the private partner's aim within the collaboration was to achieve the gains from knowledge and data sharing.
- **Pre-existence of the outcomes of other Pillars:** Several Translation Pillar activities and outputs are built on outcomes from both the Research and People Pillars (though this does not imply these outcomes have to occur through Newton funding). Strong research collaborations, a large, well trained workforce, and facilities which improve the quality of research not only enable the creation of more products which apply said research, but also realise the prestige of country's role in STI within different sectors. Certain experiences explored in the case studies highlight this, such as the South African Newton Advanced Fellowship project which aims to improve the team's biomarker identification and pharmacogenomics expertise in order to develop clinically translatable findings that help to stratify tuberculosis patients. Whilst this project is under the People Pillar, the main objective is to allow the team to pursue further projects producing Translation outputs.

### Challenges:

- **Funding and bureaucratic processes:** Overall, the funding and bureaucratic processes of the Fund worked well. However, there were several cases in which survey respondents and case studies highlighted that differences in government or institutional funding mechanisms or bureaucratic processes slowed down projects and affected their delivery. As much as the Translation Pillar work deals with innovation (and in many cases works toward producing products), bureaucratic flexibility and fluid funding release is important. The success of the Brazilian Zika project's ability to produce training and facilities which could assist with government response to the 2015-16 outbreak were in part credited to the UK partners' ability to quickly release funds to this need, but processes to release funding at a government level were sometimes not aligned or not available across the whole programme.

## 8. Assessment of processes

### 8.1 Introduction

The process evaluation submitted in July 2018 provides a full assessment of Newton Fund processes and is not replicated here. However, the timing of the analysis for the process evaluation meant that only two country field visits for our thematic case studies had been conducted. This chapter summarises the main findings from the process evaluation and contains additional qualitative insights gathered from the subsequent fieldwork in eight countries. The evaluation question which is answered through the dedicated process evaluation and here is as follows:

- EQ2.4: How effective are the processes in place for the delivery of the Newton Fund?

### 8.2 Summary of findings

**There is scope to improve processes underpinning the Newton Fund**

Rating	Findings
	<p>A one-size-fits-all approach to processes, while much simpler to deliver, would not be appropriate for the Newton Fund. Flexibility and adaptability have been key to success so far. Nevertheless, the process evaluation found that there are benefits to be realised from making explicit what has been implicit, such as formalising expectations both in terms of the Fund itself and of the different actors involved.</p> <p>There are also areas where the processes and structures could be strengthened or improved to make it easier for the Fund to maximise its potential efficiently and sustainably namely: establishing a formalised strategy; progressing plans for an improved reporting system and providing information / guidance to alleviate the difficulties with match funding to the extent possible.</p> <p>The elements that are working well and which should be maintained include the flexibility (for example to deal with external, unexpected events) and the role of the in-country teams, as highlighted throughout this report.</p>

### 8.2.1 Strength of evidence

Rating	Evidence and limitations
<span data-bbox="165 406 231 473">G</span>	<p>The process evaluation is based on a review of Newton Fund documentation and more than 50 interviews with BEIS (the policy team, and the ODA Research Management Team), UK delivery partners and in-country teams.</p> <p>Fieldwork findings are used to supplement the process evaluation in this chapter. Given the specificity of the situations and experiences in different countries, and the focus of the fieldwork on capturing emerging impacts, processes were assessed in so far as they impacted pathways to change.</p> <p>Where possible and appropriate, data collected from the telephone survey provides some supplementary quantitative information on the scale of the issues experienced for the sample of respondents.</p>

## 8.3 What is working well

The delivery model is complex and unusual. As explained in *Chapter 2* and the process evaluation, while some elements of the delivery model are replicated in other funds (for example GCRF also uses ODA funds, and involves many of the same delivery partners; and the Prosperity Fund also has in-country officers operating out of British Embassies / High Commissions), the match funding requirement sets the Newton Fund apart.

### Flexibility to deal with external events

As stated in the process evaluation, “Flexibility is key to achieving match, as it involves overcoming a variety of political and bureaucratic idiosyncrasies as well as unforeseen challenges.” The importance of flexibility in the event of unforeseen challenges was further confirmed during the fieldwork visits and is best illustrated by the experience of economic and political crisis experienced in Brazil.

After the launch of the Newton Fund in 2014, the Brazilian economy entered a recession. The situation progressively worsened. At the same time, Brazil experienced a political crisis, culminating in the impeachment of the then President Dilma Rousseff. This led to public sector funding cuts, including in science and research budgets. These events jeopardised the Brazilian government institutions’ match funding commitment. Most state funding agencies (FAPs) went to great lengths to provide the committed amounts despite the crisis. There were also important efforts for strategic and financial engagement with the programme by federal partners, and funding constraints had a negative impact on projects in some states, leading to delays and reputational damage for the Brazilian state partners involved. Two FAPs in particularly hard-hit states did not provide the agreed match for some collaborations, though this represents a very small proportion of the match funding provided by Brazil throughout the Newton Fund.

In this case, the Newton Fund model allowed activities to continue and for requirements to be relaxed given the exceptional circumstances, and the fact that every effort had evidently been

made to make good on commitments. This underscores the importance of not having hard and fast rules but considering specific circumstances and allowing exceptions when external events necessitate.

### **The role of the in-country team in smoothing the process**

Linked to the above point on the importance of local context, situation and needs, is the critical importance of the in-country teams in smoothing the process of delivering match funding requirements. The importance of the in-country team acting as BEIS' eyes and ears on the ground, connecting the central Newton Fund objectives and the local context, was evident in every field visit. Indeed, the evaluation team were able to observe first-hand how the teams provide an important bridge between the UK and partner countries, often identifying problems before they fully emerge or acting as interlocutors when they occur.

An example of this is when in-country teams use their knowledge of the local funding cycles and insight into the capacity of local partners, to mitigate the risk of over-burdening a given partner organisation at peak capacity by advising UK delivery partners on the most appropriate timing to launch activity.

In India, the in-country team have identified a real risk of overburdening the largest local funding partner involved in the Newton Fund, which does not have the administrative capacity to manage the implementation of many concurrent programmes. They have actively sought solutions to manage the administrative barriers which would result from overstretched institutional capacity and have an adverse impact on project delivery. The contextual knowledge and understanding, local know-how and oversight of the in-country team makes this kind of needs-based problem solving possible.

The issue of local capacity also emerged in South Africa, and again the in-country team played a vital coordination role. The expectation was that the Newton Fund would be a large programme, but it grew beyond expectations, almost to a stage where the local funding partners were overwhelmed. The sheer numbers of delivery partners and a short inception led to administrative and coordination issues. This was mitigated through the in-country team that worked as an intermediary in discussions with South African counterparts.

## **8.4 Challenges**

The findings from the surveys and field visits confirmed two areas where there are challenges or scope for improvement.

### **Funding and administrative processes**

One persistent challenge raised by stakeholders was the rigid financial structure for funding from the UK side and lack of alignment of the UK fiscal year with partner country funding cycles. From several field visits, a similar theme was the administrative hurdles arising mainly from the difference in funding systems processes and timelines between the UK and partners.

These issues were evident for a minority of respondents to the online survey: 35% (262) of respondents<sup>38</sup> chose administration processes as the greatest difficulty they faced whilst carrying out their funded research ('getting sufficient funding' was the next most chosen difficulty -18% of respondents said it was their biggest difficulty). Of those who chose

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<sup>38</sup> Source: Online Survey H2. Q146. Base: All Newton Fund participants who encountered difficulties

'administration processes', 60% of those referred to the administrative process of their own institution as the biggest difficulty; 21% referred to the administrative process at a UK partner institution; and the remainder (19%) referred to a non-UK partner institution. Within these responses, the most commonly cited reasons for the difficulty were bureaucracy (27%), administration of funding (30%), and the time taken up by administration (23%). A similar picture emerged from the data from the telephone survey. It found that slightly less than a fifth of respondents (18%) had experienced issues during their collaboration efforts, and the nature of these issues was typically administrative (11 respondents) or communication issues (9 respondents).

Experiences from the case studies provided insight into some of the issues which emerged when partner funding budget cycles did not align with Newton Fund projects. There are examples from different countries where this issue was raised: South Africa, Brazil, and the Philippines. This meant funds could not be released on time and projects did not necessarily launch on time. In one case, delays were further compounded when UK delivery partners had a limited understanding of local processes. In Brazil, a lack of understanding of financing mechanisms for universities on the part of some UK partners led to delays – in some instances of up to two years.

Another recurring challenge in the case study countries, such as India, the Philippines and Mexico, was that local funding is reviewed annually. For example, for a project in the Philippines, the main difficulty reported by both delivery partners was the issue of funding release and differing review processes between countries. The UK and the Philippines have different procedures for releasing funds, as the UK partner has funding pre-approved for the three-year span whereas the partner funder requires a yearly review, which is evaluated to approve next year's budget. In one case, the team had considerable difficulty during their first annual review, which delayed the release of funds by two months and affected deliverables and timelines.

### **Tap further into the potential of the in-country team**

The process evaluation found that one of the benefits of match funding was the relation building potential of this requirement, and by extension the importance of capitalising on the role of the in-country team in this process. In terms of assessing processes, the field visits highlighted the importance of the in-country teams in problem solving as well as relationship building. However, the visits also demonstrated that the in-country team's contextual knowledge, local understanding and professional connections, while generally well-integrated, could still be better taken advantage of by delivery partners. This is specifically mentioned in the case study reports for Brazil and Philippines. For instance, the in-country teams could be better utilised as facilitators for wider learning and to capture local viewpoints even more.

# 9. Long-term impact and sustainability

## 9.1 Introduction

Building on the previous chapters, which have looked at relevance of Newton Fund activities and effectiveness of activities under the three Pillars in achieving the desired outputs and outcomes, here we examine the highest level of potential impact of the Fund across all of these activities. The creation of strategic partnerships are covered separately in Chapter 10. The focus here is the potential for long-term impact. Four years since the launch of the Fund, with projects at varying stages of implementation, impacts are not tangible at this mid-term point but the direction of travel should be visible and align with planned impacts. As part of this forward-looking chapter, we also consider how sustainability has been incorporated into the Fund's design and implementation.

### Fit with Theory of Change

The highest Fund level impact the Newton Fund seeks to achieve, as captured in the Theory of Change, is to create “science and innovation partnerships and strengthened capacity to promote the economic development and social welfare in partnering countries”. This occurs based on a set of preceding impacts, also captured in the Theory of Change, namely: enhanced engagement in areas of interest leading to commercial and political opportunities for partner countries and the UK, progress towards addressing development challenges (e.g. health, climate change, food security, etc.) and strengthened science and innovation systems and infrastructures. In turn, these impacts are based on the establishment of strategic partnerships and positioning and branding of UK expertise, meaning that the UK is seen as the partner of choice (covered under Chapter 10), as well as the adoption / use of innovative products, services and knowledge, and increased preparedness and resilience to global challenges.

(Sustainability does not feature explicitly in the Theory of Change. Factoring considerations about sustainability into the programme design and implementation is a mechanism by which to ensure impacts are maintained).

We answer the following questions using the judgement criteria beneath each question:

- *EQ4.2:* Is there a demonstrable link between Newton Fund activity and current or potential future poverty reduction and social welfare improving economic development in the partner countries?
- *EQ5.2:* How well has sustainability (and the pre-conditions for sustainability) been factored into programme implementation from the beginning and with what actual and potential effects?

## 9.2 Summary of findings

**The Fund is on track to deliver its intended impacts – but few will be fully observable within its lifetime and their sustainability is at risk**

Rating	Findings
GA	<ul style="list-style-type: none"> <li>As demonstrated in <i>Chapter 4</i>, the relevance of Newton Fund activities means that if they are well implemented, they should deliver in line with their objectives (which are ODA compliant).</li> <li>It is too early to find evidence of Fund-level impacts, and no comprehensive data was available on the potential for impacts. However, where data exists, it confirms that Newton Fund activities should be well-placed to contribute to the long-term objectives of the Fund.</li> <li>Where it was possible to gather information directly from award holders, they were able to confirm that their work would contribute to support development and welfare in partner countries; economic development was a little stronger than the potential for poverty reduction.</li> <li>In terms of the sustainability, this is an area where more long-term thinking is needed to put in place the mechanisms to ensure Fund-level impacts are sustained. At the level of specific activities, the limited sample of award holders consulted shows confidence in the sustainability of impacts resulting from their activities.</li> </ul>

### 9.2.1 Strength of evidence

Rating	Evidence and limitations
AR	<p>The focus has been on identifying potential for impact and the direction of travel in terms of achievements at this mid-term stage of the Fund. Impacts are still emerging for two reasons: activities are still on-going, and, even where they are complete, impacts may take many years to materialize.</p> <p>The online survey provides limited insight into emerging impact but the telephone survey (which was designed to capture more qualitative insights) provides award holders' own assessment of the contribution of their work to economic development and other impacts. This is the main source of evidence used in this section. The case studies provide further in-depth qualitative insight. Some supplementary evidence comes from the Newton Fund website where success stories and candidates for the Newton prize are showcased<sup>39</sup>.</p>

<sup>39</sup> <http://www.newtonfund.ac.uk/newtonprize/projects/>

	<p>There is a potential for bias in these data (since respondents to the survey may overestimate potential impact). Our case studies were identified (in part) to demonstrate the potential for impacts.</p> <p>A limitation of the telephone survey is that the responses show some issues with interpretation. Responses to different questions show that impacts are not mutually exclusive and that there may be some overlaps in the categories of impact discussed. Responses were inductively coded to allow respondents interpretation to structure the findings, and we report on these broad categories to capture the bigger picture, accepting that some overlap is inevitable.</p> <p>In terms of sustainability, findings from the process evaluation provide a starting point for assessing how long-term sustainability has / has not been factored into Fund design. This is further substantiated by more in-depth country specific findings uncovered in the fieldwork visits.</p>
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### 9.3 Potential for long-term impact

**Is there a demonstrable link between Newton Fund activity and current or potential future social welfare improving economic development in the partner countries or more widely?**

Rating	Findings
	<ul style="list-style-type: none"> <li>The available evidence demonstrates Newton Fund activities are supporting the contribution of the Newton Fund to (economic) development and social welfare and poverty reduction in partner countries, and to a more limited extent, cross cutting areas such as social development, environmental sustainability and gender quality.</li> </ul>

To structure the discussion this section is presented around impact themes which emerged from the telephone survey, beginning with evidence that the Newton Fund is supporting the economic development in partner countries, as well as the contribution to development more broadly (for example in education and research or health, which can be understood as underpinning economic development as well). We then focus on evidence of the contribution of the Newton Fund to social welfare in partner countries and finally other goals (environmental sustainability and gender).

#### **Evidence of the contribution of the Newton Fund to (economic) development in partner countries**

The ODA requirement means that Newton Fund activities, correctly designed and implemented should be contributing to the economic development of partner countries. In-depth case studies in eight countries proved demonstrable links can be evidenced.

Telephone survey responses showed positive assessments projects' impact on economic development within the respondents' country (over three-quarters (76%) of respondents stated

their projects had an influence on economic development within their country). After generic impacts – relating to upskilling the labour market – the most common mechanism was through health impacts, which were referred to by 20 respondents.

**Table 6: Evidence of potential for economic development through:**

		n.	%
<b>Economic development impact (generic)</b>	Responses focus on the labour market and banking sector as well as general responses stating their project will help the economy. e.g. “ <i>South Africa is a skill starved nation, so being able to bring those high-end skills to South Africa will have ultimately positive economic implications.</i> ”	<b>28</b>	<b>19%</b>
<b>Health impact</b>	Responses focus on improved public health as a route to economic development. They tended to highlight decreased public cost of the illnesses targeted or the increased productivity of the population as a result of being healthier. e.g. “ <i>we think we have gained insights which may allow us to do further studies of novel treatments [for depression] which may impact beneficially not only on the individual but on wider society and reduce the cost.</i> ”	<b>20</b>	<b>13%</b>
<b>Ecological improvement</b>	Responses focus on agriculture, reducing the intensity of farming on the land or increasing productivity. e.g. “ <i>We are working on introducing new approach to implement sustainable breeding strategy to Tilapia fish; one of the main fish Egyptians consume. Our project has a measurable economic and social impact on local farmers as we improve the performance and growth of Tilapia.</i> ”	<b>16</b>	<b>11%</b>
<b>Technological impact</b>	Responses focus on technology their project has produced, and how this has contributed to economic development, incl. technology transfer. e.g. “ <i>The target of the project is to reduce the cost of 3D ultrasound. ... The software can be used to upgrade the 2D ultrasound with a low-cost implementation of hardware. All the small clinics will be able to implement this device by themselves ...</i> ”	<b>14</b>	<b>9%</b>
<b>Social impact</b>	This covers responses which relate to impacts on society which may indirectly impact economic development. e.g. “ <i>Our project has focused on ex-combatants of the Colombian armed conflict of illegal armed groups. So, we hope that if the developments we are doing for them to help them to reintegrate into civil society, then that will allow them to have greater ease to get a job...</i> ”	<b>12</b>	<b>8%</b>

<b>Increased sustainability</b>	Responses focus on renewable energy and reducing resource use. e.g. “... water is in short supply in India and we need to conserve water... We are not only working with our project partners but also with civic partnerships to scale it up and make it more useful to the wider population. ... We aim to be able to switch off the electricity and the water remotely by mobile phone.”	<b>12</b>	<b>8%</b>
<b>Increased commercialisation</b>	Responses focus on transferability to the private sector or improved productivity to solve economic developmental problems. e.g. “By developing this microbubble generator and the knowledge we (hope we) can develop new procedures for improving production....” (Project on use of microbubbles to increase the oxygen content of water, so less water is needed in shrimp farms).	<b>11</b>	<b>7%</b>
<b>Policy</b>	This covers responses which focus on influencing policy to achieve economic development. Responses tend to focus on passing on results to policymakers. E.g. Project trying to understand the role of ambiguity/uncertainty: “...We have presented this paper at Central Bank of Turkey where they are interested because for them, they are trying to make policy in an environment with ambiguity.”	<b>6</b>	<b>4%</b>
<b>Other</b>		<b>31</b>	<b>21%</b>

Examples demonstrate the link to **socio-economic impact in the field of health** (drawing on the evaluation research, success stories featured on the Newton Fund website as an example of a success story<sup>40</sup>, and the winner of the Newton Prize):

- **Newton funded research into the Zika virus in Brazil:** The Newton Fund supported FioCruz and the University of Glasgow in investigating viral features and host responses to design preventive strategies. One of the most high-profile activities for the Newton Fund in Brazil, this MRC project can be considered very successful in terms of its research outcomes, institutional strengthening and increased visibility, and improvement of health services available to the general population. Through its virus mapping and understanding of Zika epidemiology, it has allowed for a large number of other research projects to take place, including one aiming to develop a Zika vaccine, and the project described below.
- **Uncovering the spread of Zika in Brazil:** This was an international research collaboration involving the Medical Research Council's Zika Rapid Response Initiative, USAID, and supported by the Wellcome Trust and the Newton Fund. It was led by the Universities of Birmingham and Oxford in partnership with FioCruz Bahia, the University of São Paulo, and supported by the Brazilian Ministry of Health. The team travelled across northeast Brazil in a minibus equipped with cutting-edge mobile DNA sequencing capabilities and tested samples from more than 1,300 patients infected with the virus.

<sup>40</sup> <http://www.newtonfund.ac.uk/news/success-stories/uncovering-the-hidden-spread-of-zika-in-brazil/>

They carried out genome sequencing to understand the virus' genetic make-up and were then able to track the spread of the virus across Brazil. They were able to show that Zika was present in Brazil for a full year prior to the first confirmed cases in May 2015. Northeast Brazil was the nexus of the epidemic and played a key role in its spread within Brazil to major urban centres, such as Rio de Janeiro and São Paulo, before spreading across the Americas.

- **New knowledge through improved research technologies:** a research partnership between the UCL Great Ormond Street Institute of Child Health and Chulalongkorn Paediatrics in Thailand enabled the Thai partner to develop a genomics platform and supporting analytics and infrastructure to diagnose rare diseases (which affect 8% of the Thai population). Based on the new technologies, the Thai partner was able to solve 100 undiagnosed cases through the sequencing, analysis and diagnosis of children with debilitating disorders. As well as supporting the patients and their parents and informing treatments, the collaboration has also enabled genetic counselling and prenatal diagnoses for families at risk. Improved diagnoses and clinical management will drive significant savings across the Thai health system leading to economic benefits. This project received the Newton Prize.

A slightly lower proportion of telephone survey respondents reported their projects had an influence on development more broadly (i.e. not necessarily economic development<sup>41</sup>) within their country (67% of respondents). Respondents clarified how development was supported, citing education and research, policy (linked to improving social, political development), among others, as detailed in Table 9.2. A good example of tangible linkages to the areas cited by respondents is this Newton Prize winner:

- **Environment and (potential) industry application:** A Newton Fund project tackled the problems of maintaining communications under hostile conditions, in the aftermath of natural disasters. Vietnam has devoted efforts to reducing the impact of floods, landslides, tornados and droughts, but technical and scientific solutions are still a long way off. The Newton Funded team designed an integrated heterogeneous wireless system (IHWS), which is robust in disaster scenarios, coping with issues such as 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. In cities, the IHWS can detect increases in dust, temperature, noise and carbon dioxide levels

The system has many potential applications in disaster, climate change and carbon dioxide level monitoring and management, as well as in the provision of e-health services. Academic staff and students from 20 universities throughout Vietnam have been trained in the system and several leading telecommunication companies are interested in bringing it into production.

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<sup>41</sup> Although the responses show some overlap

**Table 7: Evidence of potential for broad development through:**

		n.	%
<b>Education/research</b>	This covers responses which focus on the impact in the education sector, including the impact on academia within the Higher Education sector. E.g. <i>"Academically this was a huge contribution, we developed a database with a lot of information which is available to use".</i>	<b>31</b>	<b>23%</b>
<b>Policy (improving social, political, or economic development)</b>	This covers responses which focus on the impact of the project via policy at an institutional, local, national, and international level. These tend to be impacts that could apply to social, political, or economic development. E.g. Project studies electoral violence in Turkey: <i>"It will be will help with some democratization problems in Turkey. I think it will spill over to that domain and it will have some effect on such kind of problems related to democratization and elections."</i>	<b>25</b>	<b>18%</b>
<b>Health</b>	This covers responses which focus on the impact on public health. E.g. <i>"We are hoping various aspects of children's health will be improved including reducing obesity and this should improve educational and cognitive development".</i>	<b>22</b>	<b>16%</b>
<b>Environment</b>	This covers responses which focus on climate change, agriculture and ecological impacts. E.g. <i>"There is a call for Commonwealth countries to look at the issues around plastic use and the problems that micro plastics cause in the environment. The technologies that we are working on will contribute to reducing micro plastic contamination in the environment. All products in development are biodegradable".</i>	<b>18</b>	<b>13%</b>
<b>New research facilities/technology</b>	This covers responses which focus on the wider impact of the technology and new facilities which were a result of their project. E.g. <i>"what happens is that this is a technology that we are currently applying to the cardiovascular system, but the material can be used in other applications, such as bone, bone or fat temporary implants, gastric implants, and in aneurysm treatments."</i>	<b>15</b>	<b>11%</b>
<b>Industry application/industry competitiveness</b>	This covers responses which focus on the applications of their project in an industry, or their project's influence on industry. E.g. <i>"Beyond this project we have created a patent incubator that has a relationship with the companies and universities of our city."</i>	<b>12</b>	<b>9%</b>

<b>Other</b>		<b>14</b>	<b>10%</b>
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### **Evidence of the contribution of the Newton Fund to social welfare and poverty reduction in partner countries**

The goal of the Newton Fund is to contribute to social welfare and poverty reduction in partner countries. In that sense, economic or broad development are a means to this end. When asked specifically about the Newton Fund's direct contribution to poverty reduction, the results from the telephone survey indicate this occurs to a lesser extent at present, indicating that this is more often an indirect goal of the funded activities.

Nearly half (46%) of respondents stated their projects had an influence on social welfare within their country. The most common response was that poverty reduction was achieved via either an increase in incomes of the worst off, or a decrease in costs. Most of responses in the 'other' category (44%) refer to a possible contribution to poverty reduction in the future rather than realised influence. The methods by which the respondents indicated they had had an impact on social welfare and poverty summarised in Table 9.3.

**Table 8: Evidence of potential for poverty reduction (social welfare)**

		n.	%
<b>Increased (real) incomes</b>	This covers increasing incomes of the population, by increasing nominal incomes and/or decreasing the costs of living. E.g. " <i>I am expecting it to have an influence by reducing or minimising loss opportunity because our product hopes to reduce waste, amount of discarded fruits. If we can do that means that instead of throwing away fruits, those fruits will give them income. It will translate into better income.</i> "	<b>38</b>	<b>40%</b>
<b>Better environment/living conditions</b>	This covers improved material conditions for those in poverty that are not related to income or healthcare. These tend to focus on pollution or environmental factors typically experienced by those worse off. E.g. " <i>I think this project has given help to the villages as to improve the environment and the water quality. The improvement of the water quality in village also used our method which is a positive approach. They can use less money to improve the water quality which is very functional.</i> "	<b>18</b>	<b>19%</b>
<b>Healthcare access</b>	This covers increased health outcomes for those at the bottom of the income distribution. This includes increased access via reduced cost. E.g. " <i>If we consider that the treatment of one case of prosthetic joint infection cost around £20,000 if we can cut this amount down considerably I think that would be very significant especially for low income countries like Egypt.</i> "	<b>17</b>	<b>18%</b>

<b>Equality/ human rights</b>	This covers poverty reduction by equitable redistribution of resources. These tend to state the impacts are indirect. E.g. <i>"We aim to better to understand the mapping and geography of human rights violations... we can have an indirect effect in that the project empowers victims of human rights violations, in their access to justice. Poor families are powerless families, we can have an indirect effect."</i>	<b>6</b>	<b>6%</b>
<b>Other</b>		<b>16</b>	<b>17%</b>

### **Evidence of the contribution of the Newton Fund to crossing cutting areas**

Three cross-cutting areas where the Newton Fund has the potential for impact were the subject of dedicated questions in the survey. They were: social development, environmental sustainability and gender equality.

Two-thirds (67%) of respondents stated their projects had an influence on improved **social development** within their country (which is a higher percentage than believed their project had impacted poverty reduction). The methods by which the respondents indicated they had had an impact on social development range from social, to health and education.

In terms of **environmental sustainability**, just over half (55%) of respondents stated their projects had an influence on environmental sustainability within their country. The methods by which the respondents indicated they had had an impact on environmental sustainability ranged from a reduction in use of resources or reduced waste<sup>42</sup>, to cultural change (through increased awareness).

Just under a third (31%) of respondents stated their projects had an influence on **improved gender equality** within their country. However, the methods indicated that many considered equality within the team to constitute a contribution (46% of positive replies) which shows a different interpretation of the question than was intended. Meaningful contributions (such as a focus on equality as part of the project, female empowerment or even increased employment of women as a result of the project) were less commonly cited (by 17, 6 and 3 respondents respectively).

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<sup>42</sup> e.g. "utilising biological control will prevent the use of pesticides, it will decrease the use of pesticides so it will have an environmental impact in that sense. The value will be primarily to reduce the contamination of soils by insecticides in the context of this particular crop for Brazil this is definitely a major crop."

## 9.4 Sustainability

**How well has sustainability (and the pre-conditions for sustainability) been factored into programme implementation from the beginning and with what actual and potential effects?"**

Rating	Findings
	<p>There is evidence that the relationships and partnerships that the Newton Fund has supported will be sustainable over time, but further measures could be taken to ensure mechanisms for sustained contact and engagement between recipients are established.</p> <p>At Fund level there is no sustainability or exit strategy in place (given that funding ends in 2021). This has already posed some challenges where partner countries graduate from the DAC list, and partner country delivery partners and governments are concerned about the potential for long-term collaboration given the time limited nature of the Newton Fund.</p>

### More long-term thinking needed to ensure sustainability

Issues around sustainability were raised in the process evaluation. Specifically, discussions around ODA and funding brought to the fore the lack of formalised thinking about how to manage countries which graduate from the DAC list. While no exit strategy was developed at the inception of the Newton Fund, Chile's impending change of status prompted strategic thinking and the development of a "bespoke" exit strategy in 2016. Notwithstanding the approach taken in Chile, the process evaluation identified a need for a long-term strategy for managing "exit" from the Fund either if countries graduate from the DAC list or the funding ceases after the current commitment, post-2021. This would jeopardise the sustainability of the benefits and impacts of the Fund. This message also emerged from the case studies, for instance:

- In China the image and status of the UK as a 'partner of choice' achieved through the Newton Fund is threatened by the lack of a post-2021 strategy. The absence of impact metrics to showcase Newton's achievements was considered to be a missed opportunity to strengthen ties in the long run.
- In India, the absence of a mechanism to leverage the results of the Newton-Bhabha Fund was also seen as a weakness and gave rise to concern around the sustainability of the results, given the proportion of activity flowing through the Newton-Bhabha Fund.

The process evaluation also found that because the Newton Fund works with a number of middle-income countries, their expectations mean they already look beyond ODA cooperation. In-country teams raised the issue of sustainability beyond ODA funds as being an issue of concern. The risk of ignoring it for the UK is to lose the benefits carved by the Newton Fund's investment in these strategic countries in an increasingly competitive international science and innovation space.

### Confidence in sustainability of project impact found

Looking specifically at sustainability within projects themselves is also part of ensuring the sustainability of Fund impacts. The evidence base from the telephone survey is positive. We found a high level of confidence in the sustainability of projects: four-fifths (80%) of respondents expected their project to be sustainable after the end of the funding. The measures that respondents have taken to ensure this were<sup>43</sup>:

- Additional funding (50 respondents – 31%)
- Network maintained (38 respondents – 24%)
- Increased promotion (9 respondents – 6%)
- Increased team size (8 respondents – 5%)

However, the case studies show a more nuanced picture. While there are examples of projects that are considered to have sustainability built-in due to the change which is targeted (for example in capacity building activities) or due to the institutional support which is part of the delivery model, there are examples of partnerships which are not necessarily deemed sustainable without more funding and where sustainability is not intrinsic to the design or delivery model.

The outcomes from capacity building activities can be considered sustainable in that once capacity is built this provides increased opportunities and skills which should endure (and indeed there is evidence – as documented in *Chapter 5* – of individuals and institutions already benefiting from improved capacity). Within Research projects, the sustainability of outcomes is less certain. For example, in cases where the partnership is institutionally supported (such as the “CHANSE” activity which is detailed in the India case study report) and is part of a wider network, there is more likelihood that impacts are sustainable – they can be taken forward by the network of actors. However, the inverse is also true, where partnerships do not form part of a long-term vision for collaboration or have institutional support from government or research bodies, then they will be more reliant on funding opportunities. In terms of Translation, successful activities imply sustainable outcomes – i.e. policy change or commercialisation of products or the skills needed to achieve these outcomes. The evidence from the case studies suggests that there are some changes which might be needed to ensure sustainability of outcomes. For example, the design of the LIF programme was altered to ensure closer collaboration between Fellows and mentors after a decline in engagement was noted during the later stages of the Programme<sup>44</sup>.

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<sup>43</sup> Respondents also selected “other” or “not applicable” or “no measures” (43, 43 and 13 respondents respectively)

<sup>44</sup> Engagement decline upon completion of the second stage of the programme as fellows failed to keep in contact with mentors or the wider LIF team has been a problem for the Philippines during the programme’s first three years. ‘Demo-day’ workshops in the Philippines which included the UK LIF coaches were introduced in year three in order to tackle this problem and were well received by coaches (as detailed in our case study report for the Philippines).

# 10. Strategic partnerships

## 10.1 Introduction

This chapter assesses the impact of the Newton Fund in effectively supporting the creation and / or strengthening of **strategic partnerships**. In this chapter we answer the following evaluation question:

- **EQ4.4:** Has the Newton Fund led to a change in perceptions of the UK in partner countries? Has this led to any wider benefits such as new or wider opportunities for collaboration and trade?

### Fit within the Theory of Change

The theme explored in this chapter occurs at outcome and impact level in the Newton Fund Theory of Change. Activities in the People, Research and Translation Pillars, and the negotiations that underpin and surround them, require and lead to the establishment of strategic partnerships. Strategic partnerships, which go beyond the partnerships created at individual or institutional level, cover government to government partnerships, i.e. partnerships between BEIS and partner country ministries and / or between delivery partners.

The strategic partnerships developed through the Newton Fund can be measured by the existence of a coordinated approach to collaborations in science and innovation between the UK and partner countries.

## 10.2 Summary of findings

### The Fund is delivering on the creation of strategic partnerships

Rating	Findings
GA	<p>The Newton Fund has strengthened strategic partnerships between the UK and partner countries, particularly in the areas of science and innovation, but also beyond this by opening doors for collaboration and dialogue on other issues.</p> <p>The Newton Fund provides a platform for developing and strengthening strategic partnerships at government level. The importance of “match” as a means of influencing country priorities is evident</p> <p>There is evidence that the high levels of funding made available by the Newton Fund have helped improve the UK’s position as a partner of choice in some countries.</p> <p>Another benefit of the Newton Fund is in generating knowledge and know-how of partner country funding landscapes and systems, which provides the UK with a strategic advantage for future collaboration.</p>

### 10.2.1 Strength of evidence

Rating	Evidence and limitations
	<p>The benefits of strategic partnership are not uniform and depend on the specific context in each partner country. The evidence used in this chapter is qualitative in nature and mainly based on the thematic case studies. Where possible and relevant this is supplemented by interviews with in-country teams and findings from the process evaluation. In addition, some evidence available on the Newton Fund dedicated webpage and twitter feed has been used.</p> <p>The fact that only eight countries were covered by field visits is a limitation and means the examples should be taken as illustrative and are not a comprehensive mapping of the strategic partnerships developed.</p>

## 10.3 Strategic partnerships

**Has the Newton Fund led to a change in perceptions of the UK in partner countries? Has this led to any wider benefits such as new or wider opportunities for collaboration and trade?**

To frame the discussion, we first examine the importance of match as a means of establishing UK influence and provide some tangible indicators of (government) strategic partnerships, such as instances of co-branding, Memoranda of Understanding (MoUs) signatories, among others. We then outline emerging benefits of strategic partnerships, such as positioning the UK as a partner of choice or generating knowledge and know-how of partner country funding landscapes and systems.

**The importance of “match” as a means of establishing UK soft power in country priorities and generating knowledge of partner country priorities**

A unique selling point of the Newton Fund is the requirement for matched effort, whether this be financial contributions or in-kind support. This is a means to ensure design and delivery occurs in partnership. The match requirement means that Newton Fund actors (in-country teams and delivery partners) need to negotiate with foreign governments and ministries to secure a commitment to deliver activities in partnership.

A thematic focus of the process evaluation was match funding. A key finding, in relation to the processes underpinning match was that it had become an important vehicle for developing a sense of co-ownership of the Fund, building the partnership approach and gaining buy in.

For foreign policy objectives, the presence of a mutual interest in areas of activity is crucial to the success of the Fund. It has also given the UK unique access to and involvement in the strategic priorities of partner countries. The matched funding requirement is key to building institutional and professional connections around research, science and innovation at senior levels. Examples from the case studies in China, Brazil, and India make this benefit clearer:

- The Newton Fund in China is referred to as the UK-China Research and Innovation Partnership Fund. In 2017 the UK and China launched a Joint Strategy for Science, Technology and Innovation Cooperation, which is the first bilateral science and innovation strategy between the two countries<sup>45</sup>. The Strategy is a sign of political willingness of both the UK and China to further formalise and deepen their science and innovation cooperation. It was launched at the UK-China Science and Innovation Forum and prominently featured the UK-China Research and Innovation Partnership Fund.
- Though the relationship is long-standing, the Newton Fund has made a difference to the importance of the UK's role in Brazil. Upcoming high-level initiatives to foster bilateral collaboration include the UK-Brazil Year of Science (2018). The UK has also recently been able to generate interest within the Brazilian government for some of its priority areas, such as anti-microbial resistance. This was a topic the Brazilian government did not initially express interest in, but which has become an important cross-agency policy and research topic in the last year. Respondents also identified several benefits to the UK, including
  - the ability to influence the policy debate in Brazil, through a closer relationship with the Brazilian government, including the President's Office;
  - the opportunity to understand the Brazilian context through fieldwork and on-the-ground research. Especially in fields such as climate change, biodiversity, and neglected tropical diseases; and
  - collaborating with high-quality institutions in specialised fields.
- As per the High Commission of India, the relationship between India and the UK is “a modern partnership bound by strong historical ties”<sup>46</sup> and since 2004 has been considered a “**strategic partnership**”<sup>47</sup>. The Newton Fund partnership with India is known as the Newton-Bhabha Fund. However, it is worth highlighting how different the system is for the Indian counterpart and linked to this the importance of the present international partnership in directing funds to work in the focus area. There is no “Bhabha Fund” in India – meaning the funding for this project has to come out of the Ministry spending pot (and does so at the expense of other work). The match commitment has meant that funds have been channelled to this research area where they otherwise would not have.

Another benefit of strategic partnerships is creating insight into government priorities, which provides the UK with a strategic advantage. Having an in-country presence brings trust and facilitates communication and allows for gathering of information on priorities and local systems and preferences. This is exemplified by the case study findings in Malaysia, where some of the benefits from the Fund were cited as: opportunities to understand Malaysian research, systems, infrastructure, culture, and the challenges that Malaysia faces; knowledge and understanding of how research is applicable to reality in Malaysia and a strengthened relationship with a South East Asian country ahead of Brexit. There is a need to retain this knowledge and understanding. At present no mechanism to capture this at the Fund level is used to the knowledge of the evaluation team.

<sup>45</sup> UK government press release. See <https://www.gov.uk/government/news/joint-uk-china-strategy-for-science-technology-and-innovation-cooperation-sets-new-horizons-for-closer-international-collaborations>

<sup>46</sup> <https://www.hcilondon.in/pages.php?id=19>

<sup>47</sup> ibid.

## Evidence of government to government collaboration

Although not true in all cases<sup>48</sup>, the Newton Fund is locally branded in twelve partner countries to illustrate the joint design and delivery model and therefore co-ownership of the Fund:

- Chile: The Newton-Picarte Fund
- China: The UK-China Research and Innovation Partnership Fund
- Colombia: The Newton-Caldas Fund
- Egypt: The Newton-Mosharafa Fund
- India: The Newton-Bhabha Fund
- Jordan: The Newton-Khalidi Fund
- Kenya: The Newton-Utafiti Fund
- Malaysia: The Newton-Ungku Omar Fund
- Peru: The Newton-Paulet Fund
- South Africa: The UK-South Africa Newton Fund
- Thailand: The Newton UK - Thailand Research and Innovation Partnership Fund
- Turkey: The Newton-Katip Celebi Fund

Other indicators of high-level commitment include joint promotional events with senior government officials. For example, the following event in Hanoi documented on the Newton Fund website:

*"In honour of the Newton Programme Vietnam's 3-year achievements, a Newton Day Vietnam event was held by the Vietnamese Ministry of Science and Technology and the British Embassy, on 16 November 2017 in Hanoi. The event was an opportunity for scientists and researchers to share their experiences and perspectives on training and scientific research activities in the context of strong international integration."*<sup>49</sup>

The existence of MoU between the UK and partner country and / or symbolic gestures emphasise the importance of the bilateral relationship. Some examples of this are as follows:

- *"Today British Ambassador to Turkey @DChilcottFCO and Istanbul Governor @vasipsahin signed a science and innovation agreement on behalf of @istkaorgtr and @beisgovuk to support enhanced UK-Turkey research partnership. @UKSINet @NewtonFund @OzgulOzkanYAVUZ"* Tweet 20 March 2018.
- UK-Egypt S&I cooperation was strengthened with the signature, in 2015, of a Memorandum of Understanding (MoU) promoting bilateral cooperation across research,

<sup>48</sup> In Brazil, Indonesia, Vietnam and Mexico, the Newton Fund is simply called "The Newton Fund".

<sup>49</sup> <http://www.newtonfund.ac.uk/about/about-partnering-countries/vietnam/>

innovation, health training, cultural collaboration, and higher education<sup>50</sup>. This led to the 2016 British-Egyptian Year of Research, Innovation and Education.

- Through the Newton-Bhabha Fund, in India, a MoU was signed with the Department of Science and Technology<sup>51</sup>. There are thirteen main Indian funding partners to date, five of which are new partners (i.e. there was no formal partnership before the Newton-Bhabha Fund). Furthermore, on 26 July 2018, to reinforce the cooperation, Minister of State for Universities, Science, Research and Innovation, Sam Gyimah and Indian Minister for Science and Technology, Dr Harsh Vardhan co-chaired the biennial Science and Innovation Council meeting in New Delhi. During the council meeting, the ministers celebrated the human impact that existing cooperation through the 600 projects supported by the Newton-Bhabha Partnership had brought, such as using technology to monitor maternal health and make water safe.<sup>52</sup>
- In 2013, the Minister of Education and Mexican government representatives travelled to the UK to promote a closer relationship in the education field. Those conversations led both countries to declare 2015 as the Year of the United Kingdom in Mexico and the Year of Mexico in the United Kingdom.<sup>53</sup> President Peña Nieto's visit to London, at the beginning of March 2015, constituted an opportunity to relaunch the Newton Fund, outlining the specific programs implemented in Mexico.<sup>54</sup> According to UK respondents, the State visit in 2015 was helpful to make the Newton Fund a more prominent platform for collaboration.
- Although not solely attributable to the Newton Fund<sup>55</sup>, 2018/2019 is UK-Brazil Year of Science & Innovation.

### Funding to promote the UK as partner of choice

In addition to the relationships developed, the significant levels of funding made available by the Newton Fund have helped improve the UK's position as a partner of choice in some countries. The funding provided through the Newton Fund (from the UK side) is not uniform. Partner countries fall into one of three tiers to reflect their relative science and innovation landscape and are allocated funding envelopes accordingly. The level of funding received by different countries to date is presented in *Chapter 2*.

In China, the country with the highest funding allocation to date, UKRI explained that the funding through the Newton Fund has contributed to increasing the UK's visibility in Science and Innovation (S&I) towards Chinese stakeholders: "The level of funding offered by the Newton Fund in particular helped brand the UK's S&I cooperation and gave it greater visibility, which helped the UK gain advantage over other countries competing to engage China in S&I". We could not confirm this view with Chinese funders directly, but RCUK did mention the NSFC having prioritised their cooperation with the UK.

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<sup>50</sup> UK Government Press release, <https://www.gov.uk/government/news/the-uk-and-egypt-sign-memoranda-of-understanding>

<sup>51</sup> An addendum to the MoU is planned so that Ministry of Human Resources Development (MHRD) will be formally recognised as a partner.

<sup>52</sup> <https://www.gov.uk/government/news/uk-india-science-ministers-reinforce-strong-research-partnership-as-future-collaboration-is-announced>

<sup>53</sup> Embajada de México en el Reino Unido, 2015, Year of Mexico in The United Kingdom and of the United Kingdom in Mexico, retrieved at <https://embamex.sre.gob.mx/reinounido/index.php/en/ver-comunicados/683-2015-year-of-mexico-uk>.

<sup>54</sup> Entrevista a Salvador López Carbajal en Noticias México al Día, 5 de marzo del 2015

<sup>55</sup> The SIN team in Brazil has also worked on this initiative.

## Mid-term Evaluation of the Newton Fund

This was also true in India, which receives the second highest volume of funding, where having dedicated funds for bilateral collaboration has already changed the perception of the UK as a key partner. The UK is currently the largest bilateral funding partner for the Department for Biotechnology which has the largest portfolio within the Newton-Bhabha Fund in India, reflecting the fact that in India the government is committing a lot of funding to biotechnology and emphasising the preference for working with the UK.

South Africa is the fourth largest partner in terms of funding allocated. Evidence from the case study indicates that the UK has become a preferred partner in science and innovation. According to South African government stakeholders, the Newton Fund is largely the reason. There was little bi-lateral scientific cooperation through government counterparts before the Newton Fund. The scale of the Newton Fund is a radical change: the Newton Fund is one of, if not the, largest scientific bi-lateral partnership South Africa has in this field.

Although the level of funding is lower in Egypt, the Newton Mosharafa Fund is the first fund to support UK-Egypt cooperation in Science and Innovation. It occupies a niche position as the only Fund that offers the opportunity to create Science and Innovation focused UK-Egypt partnerships.

Similarly, while the level of funding is lower, the Newton Fund was chosen by the Malaysian Prime Minister's Department as the key highlighted international collaboration in the 2016 Global Science and Innovation Advisory Council (GSIAC) annual convention. GSIAC is a Malaysian initiative to engage with the world's top global science and innovation organisations, with a formal annual meeting to discuss Malaysia's science and innovation priorities based on recommendations from GSIAC council members.

# 11. Conclusions and Recommendations

## 11.1 Introduction

Since it was launched four years ago, the Newton Fund has delivered science and innovation activities worth £288m. These activities have been designed to foster science and innovation partnerships that promote the economic development and welfare of partner countries and is active in 17 countries at present.

At this mid-term point, and before the execution of a further £335m which is forecast to be spent by the end of financial year 2020/21, we provide our assessment of the Newton Fund in terms of:

- **Relevance:** how far the Newton Fund design and planned interventions have addressed the problem stated in line with needs
- **Effectiveness:** to what extent has the Newton Fund effectively delivered results in terms of:
  - (i) capacity building;
  - (ii) research collaboration;
  - (iii) translation activities; and
  - (iv) processes.

At this mid-term stage we can assess the Fund's **potential impact and sustainability** as well as the contribution to the creation of **strategic partnerships**.

We also take the opportunity to provide final remarks on **limitations and considerations** for the Newton Fund Evaluation going forwards, and a series of recommendations.

## 11.2 Relevance

- The list of active Newton Fund partner countries contains an appropriate and relevant mix of countries with which 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, clear willingness to engage with the UK on research and innovation partnerships and are priorities for partnership with the UK. The upcoming country strategy refresh project demonstrates a commitment to reviewing the nature and scope of engagement with each partner so that it remains appropriate.
- Newton Fund activities and outputs are consistent with the higher-level goals of the Fund. Projects reviewed provided assurance that the activities pursued have been designed in line with the Fund level theory of change, are delivering outputs, and show potential to deliver outcomes and impact in the future in line with the overarching goals of the Fund.

## Mid-term Evaluation of the Newton Fund

- Sampled projects were aligned with ODA requirements. The Newton Fund is targeting activities which tackle global and national development challenges, the top three being:
  - (i) environmental protection activities (16% of all actual and committed funding)
  - (ii) agriculture (13%) and
  - (iii) health (10%).

The processes for ensuring ODA compliance are in place at Fund level and are working well.

- The population of Newton Fund award holders (and their characteristics) is not known due to the absence of comprehensive monitoring data. However, the online survey of a sample of more than 800 award holders indicates that the Newton Fund is successfully targeting researchers, higher education and research institutions, and businesses in partner countries.
- At this interim stage there is evidence of a wide range of outputs being achieved (though the assessment is made based only on a survey of a sample of award holders in the absence of Fund level monitoring data):
  - More than half (58%) of award holders have either submitted (25%) or published (33%) a peer-reviewed journal article as a result of the Newton funding they had received.
  - There is evidence that the Fund is leading to new intellectual property being created, even at this early stage: 4% of award holders have applied for IP protection and a further 2% have already received it.
  - 8% of award holders developed software or a technical product as a result of the funding they had received. Of the technical products developed, 12 had a medical/scientific purpose, with a smaller number (6) being an agricultural product.
  - 2% of award holders indicated that a start-up company or enterprise had been formed to exploit intellectual property, and a further 2% had agreed a licencing arrangement for the transfer of knowledge or technology.
- The UK Aid Strategy prioritises the rights of women and girls under its fourth strategic goal of tackling extreme poverty and helping the world's most vulnerable, while the Gender Equality Act makes clear that all ODA programmes need to be gender sensitive. The Newton Fund would be assessed as "not targeted" (or marked 0) according to the DAC gender equality policy marker as there is no commitment to targeting gender quality or mainstreaming gender in design, delivery or monitoring of Newton Fund activities. However, there are examples of specific projects which have a gender focus (for example "Women in Science" delivered by British Council in India). Where this is the case, there is nothing to collate, and critically assess potential benefits and impacts.

- **Recommendation 1:** The Newton Fund does not have a formal strategy or statement on expectations regarding how issues of gender equality should be promoted or integrated in the selection, design and delivery of Fund activities. There are examples of Newton Fund projects targeting women or gender equality issues in science and innovation. These should be critically assessed against the DAC gender equality policy marker. Further, a thematic review of how gender is being incorporated into programming at present and guidelines as to how to improve approaches to gender equality within the Fund (and how to measure them) is recommended. Context specific issues should be considered as part of the development of updated country strategies for Newton Fund partner countries.

## 11.2 Effectiveness

### 11.2.1 Capacity building

- There is strong evidence that Newton Fund activities, mainly through the People Pillar, but also through Research and Translation Pillar activities, have contributed to building research and innovation capacity in partner countries and in the UK.
- The main mechanisms through which Newton activities were found to have led to capacity improvements are:
  - **access to training and research infrastructure:** through exposing participants to new tools and technologies, new learning opportunities and expertise unavailable in their own country which would not have been accessible through other means;
  - **access to mentorship:** collaboration between senior and junior academics has enhanced the skills of award holders to engage in international research;
  - **access to networks and conferences:** opportunities to expand professional and academic networks with the result that new relationships have been forged and new opportunities identified and pursued.
- Newton Fund activities have also built the capacity of participating institutions in partner countries. Primarily this has occurred through:
  - **improvements in administering and managing** large international funds, both at the funding institution level, and the partner University level; and
  - **improvements in academic quality** arising from the development of new curricula or areas of research within institutions, provision of new equipment, fostering multi-disciplinarity and collaboration within institutions, and using Newton Fund awards to attract high quality researchers to the institution.
- **The Newton Fund has also built capacity amongst UK participants**, especially among early-career researchers. UK researchers engaging in collaborative research with partner countries have gained access to research materials and fieldwork opportunities that have furthered UK science and innovation by allowing for first-hand research in these areas of interest. Access to materials and research resources was the single most cited benefit of the Newton Fund amongst UK participants.

- **Recommendation 2:** To ensure the success and sustainability of capacity building within the Newton Fund, additional emphasis should be placed on the development and support of professional networking and virtual meeting opportunities to ensure continued peer learning and knowledge exchange, and to continue to foster new partnerships and collaborations among Newton Fund alumni.

### 11.2.2 Research collaborations

- **The Newton Fund has enabled international research that is truly collaborative in its conception, design, and implementation.** In many cases, this was the real added value and facilitated the realisation of activities that would not have been conceived or delivered without the Newton Fund and its emphasis on partnership and collaboration.
- As well as supporting qualitatively different research, the Newton Fund has also proven to be critical in **enabling research to occur at a larger scale and with greater scope than would have otherwise been possible**, facilitating synergies and cross-fertilisation of ideas across countries. This has been achieved by:
  - leveraging the (high quality) complementarity capabilities of the UK and partner countries' institutions and individuals; and
  - drawing on and combining insights from multiple disciplines to generate research outcomes that are context specific, and in many cases, which have results that have the potential for direct application in addressing development and welfare challenges.
- **The Fund has opened opportunities for the UK science base** through these collaborative research activities as follows:
  - As a springboard for further research: by generating interest and opening new opportunities for further partnerships between the UK and partner countries.
  - Growing and developing relationships and networks: the Newton Fund has enabled existing relationships to be strengthened and advanced.
- **Recommendation 3:** In assessing future proposals for activity for the Newton Fund, delivery partners should include an assessment of the collaborative value of each proposal they receive to ensure: the proposed sequencing of research between the participating research teams, the plans in place to ensure collaborative (as opposed to parallel) working, and a risk assessment to consider mitigation strategies regarding potential delays in securing funding and research permissions on each side of the partnership and the impact on collaboration. Delivery partners should also make clear how the collaborative value of projects will be ensured when they put in proposals to BEIS.
- **Recommendation 4:** BEIS should work with delivery partners to develop a more structured approach to enable the application of research outcomes into policymaking or commercialisation. For instance, provide opportunities for “catalyst funds” for Newton Fund recipients to bid for follow-on support directly linked to Fund research outcomes.

### 11.2.3 Translation

- The case studies and surveys indicate that a number of new international partnerships have been created as a result of the Newton Fund focussing on the translation of research into policy making or commercialisation. However, more detailed quantitative analysis is not possible due to the lack of comprehensive monitoring data. Among respondents to the online survey, 4% described 'a joint venture agreement reached', and 2% a 'spin-out or start-up company/ enterprise formed to exploit IP'.
- There have been several cases of collaboration with and between businesses, either during the project itself or at later stages of the innovation cycle (such as the commercialisation of medicinal products). The telephone survey found 30% of respondents indicated they were either in the private sector themselves or had private sector involvement in their collaboration.
- Precursors to the success of Translation Pillar projects include:
  - Planning for transferability and to maintain momentum: several Translation Pillar projects (or Research/People Pillar projects with Translation relevancies) train individuals and operate on placement systems. Establishing clear plans or trajectory for research outputs or collaborations after project end is also important, to ensure that outcomes are built upon and possible transferability is explored (see above conclusion and recommendation on mechanisms to ensure smoother transitions from research to translation).
  - Sharing of resources and expertise: successful initiatives are those where both the country partner and the UK partner were able to share and take advantage of the unique specialisms, facilities or resources.

### 11.2.4 Process

- The process evaluation found that issues with processes were minimal, or, as in the case of matched effort, were a double-edged sword: as the unique selling point of the fund but also the greatest challenge. Evidence from the case studies confirm that the matching funding requirement has strengths and weaknesses:
  - Flexibility to deal with external events is a strength and given the diverse political and economic contexts in which the Newton fund operates, this is deemed necessary.
  - Funding and administrative processes, which are not harmonised for UK and partner countries, can be the source of delay and other challenges in implementation.
- The role of the ICTs in smoothing processes for negotiating matched funding and all that it entails is another strength which became more apparent during field visits. Indeed, there was potential to further tap into the potential of the ICTs to smooth processes further.

Specific recommendations arising from the process evaluation were presented to BEIS in July 2018. Some of these are already being actioned by BEIS (such as the need to update and revise the Newton Fund country strategies). A **management response to those recommendations (and the additional recommendations of this report)** is advised.

## 11.3 Potential impact and sustainability

- It is too early for evidence of Fund-level impacts to be visible to any great extent. However, where data exists, it confirms that Newton Fund activities are well-placed to contribute to the long-term objectives of the Fund – evidence gathered through case studies and the surveys indicates that there is a demonstrable link between project activity and addressing development challenges and improving welfare in partner countries (and globally). This suggests strong potential for the Fund to have an impact on these issues and will be revisited during the Final Evaluation planned for 2020/21 (though it should also not be expected that final impacts will necessarily have been achieved by that time).
- In terms of sustainability, this is an area where more long-term thinking is needed to put in place the mechanisms to ensure Fund-level impacts are sustained. At the level of specific activities, the limited sample of award holders consulted shows confidence in the sustainability of impacts resulting from their activities.

- **Recommendation 5:** With the level of funding not confirmed beyond 2021, it is an appropriate time for BEIS and UK delivery partners to discuss plans for ensuring the sustainability of Newton Fund results (including the collaborations and networks already established). This should include a strategy for engagement beyond 2021 for the different countries, which considers the implications for the work of delivery partners, as well as the impact of a loss of engagement between the UK and partner countries given the political importance of the Fund in many partner country governments and institutions. Clear objectives need to be set at Board level for the exit of the Fund from all countries (or for transitioning of support via new partnerships or assistance) to ensure continuity in the benefits to the UK and partner countries.

## 11.4 Strategic partnerships

- The Newton Fund provides a platform for the development and strengthening of strategic partnerships at government level. The importance of matched funding (or matched effort) ensures that there is mutual interest in and commitment to enhanced collaboration and strengthening of innovation systems. As such, partner countries are far more engaged and empowered than might otherwise be the case in more traditional forms of bilateral development assistance.
- There is evidence that the levels of funding made available by the Newton Fund have helped improve the UK's position as a partner of choice in some countries.
- The Newton Fund is generating knowledge and know-how of partner country funding landscapes and systems, which provides the UK with a strategic advantage for future collaboration.

## 11.5 Limitations and considerations

### 11.5.1 Absence of Fund-level monitoring data

- The Newton Fund still lacks a comprehensive and consistent approach to gathering evidence on Fund outputs and outcomes generated, or the number and characteristics of award holders supported by the Fund. This limits the extent to which the evaluation can assess performance at Fund level and presents an accountability issue for BEIS in terms of the understanding of how funds are being spent, where and with what results. Recommendations were made in 2016 by the evaluation team on this issue but there remains no coherent approach to collating such data. We understand that a transformation project that will gather monitoring data for BEIS ODA funds (the Global Challenge Research Fund and the Newton Fund) is foreseen, however the timeline is not known.

- Recommendation 6:** Concerted action is needed to gather consistent and comprehensive monitoring data on Newton Fund award holders, and the outputs and outcomes generated. This should include a requirement for delivery partners to provide regular reporting on award-level activities and outputs, and to share data on the award holders supported by the Fund as a condition of their funding agreements. The collection of these data is important as these will form part of the evidence base to demonstrate accountability.

### 11.5.2 Evaluation scope and approach

While the Newton Fund has expanded in scale and scope since the commencement of the evaluation, the only change to the scope of the evaluation so far agreed is to delay the timing of the Final Evaluation to 2021. As such the current approach remains focussed on 15 countries and should be revised in discussion with BEIS as to how to ensure that all countries are included in the scope of the Final Evaluation. The evaluation team can then prepare a revised approach to the evaluation scope and approach following discussions on BEIS preferences.

- Recommendation 7:** Linked to this, there is a need to review the Evaluation Terms of Reference to consider how to reflect the expanded scale and scope of the Fund in the final evaluation, as well as reflect on the lessons learned from the mid-term evaluation and the challenges encountered.
- Recommendation 8:** The mid-term evaluation will be the only evaluative evidence of the progress and achievements of the Newton Fund to take place prior to the final evaluation in 2021. It is recommended that BEIS consider undertaking additional evaluation activities during the intervening period to ensure a flow of evidence can be provided to BEIS, the Board and other interested parties. We suggest that this could take the form of deep dive studies on particular areas of interest or concern (such as issues of gender mainstreaming, quality of research and others identified within this report).

## Annex 1 – Revised Evaluation Framework

Newton Fund Evaluation Framework														
Evaluation questions	Judgement criteria	Indicators	Sources of evidence											
			Evaluation team						Newton Fund partners					
			Country-level baselines	Country-level endlines	Online surveys/telephone interviews	Thematic impact studies	Process Evaluation	Online surveys/telephone interviews	UK benefits survey	Thematic impact studies	VfM Assessment	Monitoring data	Adhoc evaluation studies	Country strategies
1) Relevance: Does the Newton Fund design and planned interventions address the problem stated in line with needs?														
1.1	Are the activities and intended outputs consistent with the intended outcomes and impacts of the Newton Fund?	1.1.1 Extent to which Newton Fund activities were based on existing evidence and expected to deliver the expected results	1.1.1.1 Evidence of rationale for country selection process					✓						
			1.1.1.2 Number of intended award holders and characteristics									✓		
			1.1.1.3 Number of targeted award holders reached								✓			
			1.1.1.4 Evidence of rationale for planned activities				✓					✓		
1.2	To what extent has the Newton Fund targeted, reached and benefited its intended recipients? Are there gendered differences in terms of gender realised?	1.2.1 Extent to which Newton Fund partners have targeted recipients 'in need' and reached these recipients including women	1.2.1.1 Proportion of award holders - who could not have secured funding otherwise - targeted and benefiting from Newton Fund activities			✓						✓		
			1.2.1.2 Proportion of women targeted and benefiting from Newton Fund activities									✓		
1.3	To what extent have the funded activities targeted the economic development, welfare and poverty issues in partner countries?	1.3.1 Extent to which the funded research activities targeted economic development, welfare, and poverty issues	1.3.1.1 Evidence of activities targeting economic development, welfare and poverty issues (with documented case studies)			✓				✓			✓	
1.4	To what extent have the funded activities provided additionally?	1.4.1 Extent to which the funded capacity building activities had additionally, and how	1.4.1.1 Evidence of capacity building which would not have happened otherwise	✓	✓		✓	✓						
		1.4.2 Extent to which the funded research activities had additionally, and how	1.4.2.1 Evidence of research collaboration which would not have happened otherwise	✓	✓		✓	✓						
		1.4.3 Extent to which the funded translation activities had additionally, and how	1.4.3.1 Evidence of translation activities which would not have happened otherwise	✓	✓		✓	✓						
2) Effectiveness: To what extent has the Newton Fund effectively delivered results?														
2.1	Have activities under the People pillar improved capacity building in science and innovation (for individuals and institutions)?	2.1.1 Extent to which People pillar activities have improved capacity for individuals, and how	2.1.1.1 Evidence of benefits for early career researchers			✓		✓				✓		
			2.1.1.2 Evidence of benefits for researchers			✓		✓				✓		
			2.1.1.3 Evidence that researchers benefit from access to improved facilities			✓		✓				✓		
			2.1.1.4 Other capacity building benefits achieved				✓							
		2.1.2 Extent to which People pillar activities have improved capacity for institutions, and how	2.1.2.1 Evidence of improved research facilities in institutions			✓			✓			✓		
			2.1.2.2 Evidence of other capacity building benefits achieved			✓								
		2.1.3 Extent to which People pillar activities have improved capacity for UK partners, and how	2.1.3.1 Evidence of benefits to UK researchers and institutions											
2.2	Have activities under the Research Pillar enabled successful research collaborations, and how? What are the benefits?	2.2.1 Extent to which activities under the Research Pillar enabled successful research collaborations	2.2.1.1 Number of research collaborations contributing to economic development needs			✓			✓					
			2.2.1.2 Favourable feedback from stakeholders on value of research collaboration			✓	✓		✓			✓		
			2.2.1.3 Evidence of research collaborations contributing to needs			✓						✓		
		2.2.2 Extent to which UK science and innovation base opportunities opened up through these collaborative research activities	2.2.2.1 Evidence of new UK-partner country partnerships	✓	✓									
			2.2.2.2 Evidence of further opportunities opened up (with documented case studies)	✓	✓		✓	✓	✓	✓		✓		
			2.2.2.3 Start-ups and spin-outs arising from given interaction	✓	✓		✓	✓	✓	✓		✓		
			2.2.2.4 Joint ventures / research institutes / research groups	✓	✓		✓	✓	✓	✓		✓		
2.3	Have activities under the Translation Pillar created collaborative solutions to development challenges and strengthened innovation systems?	2.3.1 Extent to which translation pillar activities have created collaborative solutions to development challenges, and how	2.3.1.1 Evidence of activities creating collaborative solutions to development challenges (with documented case studies)			✓			✓			✓		
			2.3.1.2 Evidence of business and industry partners (SMEs/ non-SMEs) engaging in collaboration	✓	✓		✓		✓			✓		
			2.3.1.3 Evidence of business/industrial collaborators/SMEs introducing innovations	✓	✓		✓		✓			✓		
		2.3.2 Extent to which translation pillar activities have strengthened innovation systems, and how	2.3.2.1 Evidence of activities strengthening innovation systems (with documented case studies)			✓			✓			✓		
		2.3.3 Extent to which UK science and innovation base opportunities opened up through these translation activities	2.3.3.1 Evidence of further opportunities opened up (with documented case studies)			✓			✓			✓		
2.4	How effective are the processes in place for delivery of the Newton Fund?	2.4.1 Extent to which the established processes (especially the allocation of responsibilities) likely to support the delivery of policy priorities (as expressed in the country strategies)	2.4.1.1 Evidence of processes which have worked well / less well				✓				✓		✓	
			2.4.1.2 Evidence of areas which can be improved going forwards				✓				✓		✓	
		2.4.2 Extent to which the mechanisms in place are sufficiently robust to ensure that economic development and welfare is consistently the priority of the activities funded	2.4.2.1 Evidence of processes which have worked well / less well				✓				✓		✓	
		2.4.3 Extent to which the established procedures have ensured that the matched funding criteria secured the desired commitment of the partner countries	2.4.3.1 Evidence of processes which have worked well / less well				✓				✓		✓	
			2.4.3.2 Evidence of areas which can be improved going forwards				✓				✓		✓	
2.5	What outputs can be identified from projects, across all three pillars?	2.5.1 New partnerships	2.5.1.1 Evidence of new partnerships									✓		
		2.5.2 New products and processes have been developed	2.5.2.1 Patent applications			✓		✓				✓		
			2.5.2.2 Patents awarded			✓		✓				✓		
		2.5.3 Generation of publications	2.5.3.1 Number of publications in peer reviewed journals			✓		✓				✓		
			2.5.3.2 Publications in the top 10% of journals by impact across all subjects			✓		✓				✓		
3) Efficiency and Value for Money: To what extent was the Newton Fund delivered efficiently?														
3.1	Has the Newton Fund delivered good value for money?	3.1.1 Extent to which the Newton Fund has delivered good value for money	3.1.1.1 Programme outcome unit costs vs benchmarks from other programmes								✓	✓		

3.2	How much additional support (co-investment) from other sources did funding through Newton allow partner country researchers or businesses to leverage?	3.2.1	Quantity of co-investment	3.2.1.1 Amount of funds leveraged							✓	✓					
				3.2.1.2 Number of co-investors							✓	✓					
<b>4) Impact: Has the Newton Fund achieved its objectives?</b>																	
4.1	What factors contribute to building absorptive science and innovation capacity in partner countries? Are any countries benefiting more than others? If so why and what lessons might be learned?	4.1.1	Present and future potential	4.1.1.1 Number of publications with one or more foreign author (international collaboration)	✓	✓								✓			
				4.1.1.2 Share of world's total publications	✓	✓								✓			
				4.1.2.1 Patent applications	✓	✓								✓	✓		
		4.1.2	Innovation collaboration potential	4.1.2.2 Capacity for innovation	✓	✓								✓			
				4.1.2.3 Company spend on R&D	✓	✓							✓				
				4.1.2.4 University-industry collaboration in R&D	✓	✓							✓				
		4.1.3	Student and researcher mobility	4.1.3.1 Outbound mobility ratio	✓	✓									✓		
				4.1.3.2 UK's rank as a destination for country's HE students	✓	✓									✓		
				4.2.1.1 Enumeration of specific links (with documented case studies)			✓				✓						
4.2	Is there a demonstrable link between Newton Fund activity and current or potential future poverty reducing economic development in the partner countries?	4.2.1	Extent of links between Newton Fund and potential future poverty reduction and economic development in partner country	4.2.1.2 Favourable feedback from stakeholders on links between Newton Fund and current or potential future poverty reducing economic development in the partner countries			✓										
				4.3.1.1 Women as a share of total researchers	✓	✓											✓
				4.3.1.2 Women gross enrolment in tertiary education	✓	✓											✓
4.3	Is there any demonstrable sustainable impact on gender equality or environmental sustainability in the partner countries?	4.3.2	Sustainability impacts	4.3.2.1 Value of green technologies from Newton-funded research									✓				
				4.4.1.1 Evidence of qualitative value of new international partnerships	✓						✓	✓	✓				
				4.4.2.1 Evidence of UK as a partner of choice		✓											
		4.4.2	Evidence of change of perception of UK in partner countries due to Newton Fund	4.4.3.1 More opportunities in partner countries	✓				✓		✓		✓				
				4.4.3.2 Value of new opportunities		✓			✓		✓		✓				
				4.5.1.1 Increase in productivity	✓												
4.4	Has the Newton Fund led to a change in perceptions of the UK in partner countries? Has this led to any wider benefits such as new or wider opportunities for collaboration and trade?	4.4.3	Extent of new or wider opportunities for collaboration and / or trade due to Newton Fund	4.5.1.2 High-skilled researcher jobs created	✓												
				4.5.1.3 Improved commercial opportunities for UK businesses in emerging countries	✓												
				4.5.1.4 Increase in FDI in RAD sector	✓												
		4.5.1	Indirect benefits in UK and partners	4.5.1.5 Increase in education exports	✓												
				5) Sustainability: Are the benefits that have been achieved by the Newton Fund likely to be sustained?													
5.1	What are the longer term impacts from the Newton Fund that can be anticipated beyond the evaluation period?	5.1.1	Identified longer term impacts	5.1.1.1 Qualitative expected impacts (with documented case studies)							✓	✓					
				5.1.1.2 Quantification of specified expected long term impacts							✓	✓					
5.2	How well has sustainability (and the pre-conditions for sustainability) been factored into programme implementation from the beginning and with what actual and potential effects?	5.2.1	Extent to which there is a sustainability framework in place	5.2.1.1 Evidence of sustainability within design and delivery of Newton Fund				✓	✓		✓						
				6) Complementarity and coordination: To what extent has the Newton Fund complemented and contributed to the work of other stakeholders in the sector?													
6.1	How successfully has the Newton Fund worked with other organisations/ programmes to achieve results they would not have achieved otherwise?	6.1.1	Synergistic effects – the extent to which the Newton Fund has led to synergistic benefits with other UK-funded programmes and external stakeholders in the sector	6.1.1.1 Additionality - amount of value derived surplus to sum of constituent funds				✓				✓					
				6.1.1.2 Match funding derived as a result of securing Newton funds				✓				✓					
6.2	Has the Newton Fund's coordination with other stakeholders led to the mainstreaming/ uptake of best practice?	6.2.1	Catalytic effects – the extent to which the Newton Fund has resulted in changes in attitudes and behaviours amongst other organisations in the sector	6.2.1.1 Attitudes towards collaboration (more likely to do it in the future)				✓			✓						
				6.2.2.1 Leadership effects – the extent to which the Newton Fund has influenced the mainstreaming of policy and practice and as such led to greater sustainability of the benefits realised				✓			✓						

# Annex 2 – Methodological Note

## A2.1 Introduction

Following the Inception Phase (September - October 2015), an **Inception Report** was produced by the evaluation team, which included the findings from a literature review on Newton Fund themes of interest, the draft Theory of Change for the Fund based on available programme documentation and an outline methodology for the evaluation. The report also presented options for the evaluation for consideration by the (then) Newton Fund Board. These varied in terms of the level of in-depth country coverage possible, and the research methods to be employed. Harmonisation of outcome metrics across delivery partners was viewed as a key issue for evaluation purposes, and it was agreed that an early task for the evaluation should be to undertake a review of existing monitoring systems, data and processes. A decision on the total funding to be allocated to the evaluation was made at the end of Inception, allowing the evaluation strategy to be finalised in the next phase.

The evaluation team then engaged in the Initial Analysis Phase (November - February 2015) with the aim of gathering baseline information and getting more familiarised with the programme. This phase included a number of workshops with delivery partners, Newton Fund staff and key stakeholders, as well as three week-long familiarisation visits to the following countries: Mexico, China and Thailand (including a visit to the Singapore Hub), and the review of monitoring systems. The Initial Analysis Phase concluded with the production of four distinct deliverables:

- A revised **Evaluation Strategy**, incorporating more specific aspects of the evaluation, the justification for design and approach choices, and the Monitoring System Review. This was presented to and agreed by the Newton Fund Expert Evaluation Advisory Group (EEAG) which comprised members from DFID, FCO, Treasury, the National Audit Office, BIS, and an independent academic advisor;
- A **Review of Monitoring Systems** report (also included as an Annex to the Evaluation Strategy) identifying ways in which harmonisation would be possible, and identifying the most important indicators to enable the progress of the Fund to be regularly reported on a consistent and comparable basis;
- An **Initial Analysis Report**, summarising the key learning points from the Initial Analysis Phase. This included early recommendations to the programme management team with regards to Year 1 of the Newton Fund and the delivery structure of the Fund; and
- An **overarching Baseline Report and 15 country-level Baseline Reports** presenting the findings of desk-based research on relevant secondary data to establish comparable baselines for each Newton Fund country active at the time. An overarching summary report accompanied these individual baseline reports to summarise the situation at baseline for the Fund as a whole.

### A2.1.1 Evaluation approach

We used an **evaluation framework** to guide the data collection and analysis of primary and secondary data. It included the evaluation questions, sub-questions where relevant, the judgment criteria the evaluation team used to answer the questions, and the indicators used to

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inform our judgment. Reflecting the evolution of the Fund since inception, a revised evaluation framework has been created reflecting the fact that assumptions around availability of monitoring data have not materialised (i.e. there remains no comprehensive or consistent monitoring data across the Fund). This revised evaluation framework can be found in *Annex 1*. It focusses on addressing the following questions (most but not all of which are addressed as part of this mid-term evaluation):

**Table 9: Evaluation questions**

DAC criteria	Evaluation questions	Mapping to Theory of Change and indicators
Relevance	Are the activities and intended outputs of the Newton Fund consistent with the intended outcomes and impacts of the Newton Fund?	Capacity (1), knowledge production (2), and products, solutions, policies derived from science and innovation research (3) are supported by relevant activities  <b>Key indicators:</b> Number of intended award holders and characteristics; Number of targeted award holders reached; Evidence of rationale for planned activities
	To what extent has the Newton Fund targeted, reached and benefited its intended recipients? Are there gendered differences in terms of benefits realised?	Characteristics of up-skilled students, researchers and managers in partner countries  <b>Key indicators:</b> Proportion of award holders – who could not have secured funding otherwise – targeted and benefiting from Newton Fund activities; Proportion of women targeted
	To what extent have the funded activities targeted the economic development, welfare and poverty issues in partner countries?	Knowledge and research base are strengthened in relation to development challenges  Policy changes are towards local development needs and global challenges  <b>Key indicators:</b> Proportion of activities targeting welfare, economic development and/ or poverty issues
	To what extent have the funded activities provided additionality?	<b>Key indicators:</b> Activities which would not have happened otherwise and their added value

Effectiveness	Have activities under the People pillar improved capacity building in science and innovation (for individuals and institutions)?	Improved capacity in delivering high quality science and innovation research in partner countries  Increasing internationalisation of researchers and institutions  <b>Key indicators:</b> (Early career) researchers gaining capacity benefits; Researchers with access to improved facilities
	Have activities under the Research Pillar enabled successful research collaborations, and how? What are the benefits?	Increase high quality, international collaborative research outputs in science and innovation in partner countries  <b>Key indicators:</b> Research collaborations contributing to economic development needs; Favourable feedback from stakeholders on poverty reduction effects
	Have activities under the Translation Pillar created collaborative solutions to development challenges and strengthened innovation systems?	Increased number of products, solutions, policies derived from science and innovation research in partner countries and the UK  Adoption/ use of innovative products, services and knowledge  <b>Key indicators:</b> Activities creating collaborative solutions to development challenges; Evidence of business/industrial collaborators/SMEs introducing innovations; Evidence of activities strengthening innovation systems
	How effective are the processes in place for delivery of the Newton Fund?	<b>Key indicators:</b> Evidence the established processes likely to support the delivery of policy priorities; Evidence of robust processes to ensure ODA compliance; Evidence of established procedures to ensure that the matched funding criteria secured the desired commitment of the partner countries
	What outputs can be identified from projects, across all three pillars?	<b>Key indicators:</b> Evidence of outputs identified across the pillars

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Efficiency and value for money*	Has the Newton Fund delivered good value for money?	<b>Key indicators:</b> Programme outcome unit costs vs. benchmarks from other programmes
	How much additional support (co-investment) from other sources did funding through Newton allow partner country researchers or businesses to leverage?	<b>Key indicators:</b> Amount of funds leveraged; Number of co-investors
Impact	What factors contribute to building absorptive science and innovation capacity in partner countries? Are any countries benefiting more than others? If so, why and what lessons might be learned?*	<p>Research environment incentivising innovation and policy application; Science and innovation systems/ infrastructures strengthened</p> <p><b>Key indicators:</b> Number of publications with one or more foreign author; Capacity for innovation; UK's rank as a destination for country's HE students; Qualitative nature of factors affecting capacity</p>
	Is there a demonstrable link between Newton Fund activity and current or potential future poverty reducing economic development in the partner countries or more widely?	<p>Increased preparedness and resilience to global challenges</p> <p>Increasing focus on evidence-based decision-making</p> <p>Progress made towards addressing development challenges (e.g. health, climate change, food security, etc.)</p> <p><b>Key indicators:</b> Qualitative evidence of links</p>
	Is there any demonstrable sustainable impact on gender equality or environmental sustainability in the partner countries?*	<p>Policy changes towards local development needs and global challenges</p> <p><b>Key indicators:</b> Women as a share of total researchers; Women gross enrolment in tertiary education; Value of green technologies from Newton-funded research</p>
	Has the Newton Fund led to a change in perceptions of the UK in partner countries? Has this led to any wider benefits such as new or wider	<p>Positioning and branding of UK expertise</p> <p>UK seen as 'partner of choice'</p>

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	<p>opportunities for collaboration and trade?</p>	<p>Enhanced engagement leading to commercial and political opportunities for partner countries and the UK</p> <p>Strategic partnerships established (FDI, R&amp;D trade, etc.)</p> <p><b>Key indicators:</b> Qualitative evidence of benefits</p>
	<p>What additional or unexpected benefits to partner countries or the UK have occurred as a result of Newton Fund activities?*</p>	<p><b>Key indicators:</b> Increase in productivity; High-skilled researcher jobs created; Improved commercial opportunities for UK businesses in emerging countries</p>
Sustainability	<p>What are the longer term impacts from the Newton Fund that can be anticipated beyond the evaluation period?</p>	<p>Research environment is incentivising innovation and policy application</p> <p>Enhanced engagement leading to commercial and political opportunities for partner countries and the UK</p>
	<p>How well has sustainability (and the pre-conditions for sustainability) been factored into programme implementation from the beginning and with what actual and potential effects?</p>	<p><b>Key indicators:</b> Qualitative expected impacts (with documented case studies); Evidence of sustainability framework / considerations</p>
Completeness and coordination*	<p>How successfully has the Newton Fund worked with other organisations/programmes to achieve results they would not have achieved otherwise?</p>	<p><b>Key indicators:</b> Evidence of synergistic effects</p>
	<p>Has the Newton Fund's coordination with other stakeholders led to the mainstreaming/ uptake of best practice?</p>	<p><b>Key indicators:</b> Evidence of catalytic effects</p>

**Note 1: \*To be examined at endline**

## A2.2 Evaluation methods used at mid-term

### A2.2.1 Introduction

The research methodology for the Newton Fund mid-term evaluation is articulated around several data collection methods:

- A process evaluation
- Analysis of the Activity Tracker data collated by the ODA Research Management Team
- An online survey of Newton Fund award holders globally
- A follow-up telephone survey with selected online survey respondents
- Thematic impact case studies drawn from field visits to eight Newton Fund partner countries.

Each type of evaluation (i.e. Contribution Analysis and Process Evaluation) involved the analysis of different types of data (evaluation team primary data; secondary data such as delivery partners monitoring reports or national statistics), collected through different methods (e.g. online surveys, semi-structured interviews, case studies). To ensure that the data was analysed and synthesised in a way that provided the most objective and meaningful findings, the evaluation process:

- assessed the **quality of evidence** submitted by Newton Fund actors;
- explored the **pathways of change**, including the role of internal assumptions and external factors; and
- built upon **syntheses workshops** to discuss the interpretation of the analyses and the findings.

### A2.2.2 Process Evaluation

The process evaluation covers implementation to date (2014 - 2017). The process evaluation took place over the latter half of 2017. As agreed with BEIS, and in line with our Evaluation Strategy, the process evaluation focused on three research areas:

- Delivery of policy priorities
- ODA eligibility
- Matched funding

The questions developed (and the data gathered) support the Fund-level evaluation of relevance, effectiveness and sustainability in particular. We conducted a review of programme documents (such as business case, meeting minutes, progress reports, country strategies, contracts, and procurement) and built on these findings with interviews with relevant stakeholders. These included:

- BEIS (the policy team, and the ODA Research Management Team)
- UK delivery partners

- In-country teams

The process evaluation was not designed to gather feedback from delivery partners in country. However, to a limited extent, we could include feedback from partner country stakeholders based on the field visits undertaken as part of our impact studies.

Data collected from the documentary review and qualitative data from interviews was systematically reviewed and analysed. Limitations relating to a risk of reporting bias, and challenges stemming from incompleteness of data are explained under the methodology section of the report.

#### A2.2.3 Activity Tracker data

The Activity Tracker is an Excel Spreadsheet used as an internal monitoring tool by BIES and updated quarterly by the delivery partners. It is used by the ODA Research Management Team and BEIS to keep an up-to-date overview of current and planned activities in all partner countries.

Each row of the spreadsheet describes a single “activity”: technically a package of work with a single budget line which could be a call for research, a fellowship scheme, but not a single award within a larger work package. The data fields in the spreadsheet include descriptive fields (name, description, contact information, partner country, status), dates of call and funding period, and actual and forecast funding by quarter and by financial year. Expenditure has been recorded quarterly since 2014/15, and forecasts of future expenditure are included up to the end of the Fund in 2020/21.

#### A2.2.4 Online Survey of Newton Fund Award Holders

An online survey of award holders was undertaken to gather information about their experience of international research and innovation, and to collect feedback on the Newton funding that had been received, the activities which had been undertaken, and the perceived effectiveness and additionality of the funding. The questionnaire was developed in consultation with BEIS and each of the 15 UK delivery partners to ensure its relevance and to ensure consistent use of terminology throughout.

The survey was administered by Coffey working with a contractor who provided the web platform to host the survey. In most cases, the Newton Fund delivery partners were unable and/or unwilling to provide a full list of award holder contact details to Coffey in order to issue the request to participate in the survey. In some cases delivery partners cited concerns over data protection in sharing such data with a third party, and in others, the UK partners did not have contact details of award holders who received funding in partner countries. Reasons for this appear to be related to the fact that funding in many partner countries is administered by the in-country partners (who also provide match funding for the programme). As a result, the evaluation team does not have a complete contact list of award holders, and incomplete knowledge of the total number and characteristics of award holders. This has made it difficult to gauge the overall representativeness of the online and telephone surveys.

As a workaround to the lack of comprehensive award holder data, agreement was reached with delivery partners that they would issue the survey invitation to their award holders, whilst Coffey were able to send the invitation directly to some award holders based on contact information collected by the Newton in-country teams. Based on information supplied by the delivery partners we know that the invitation to participate in the survey was issued to more

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than 3,000 award holders (in some cases delivery partners did not confirm how many invitations were issued):

**Table 10: Online survey invitations by organisation**

Organisation	Number of award holders invited to participate
British Academy	143
RCUK	800
Innovate UK	35
Academy of Medical Sciences	45
British Council	600
Met Office	Unknown
Royal Academy of Engineering	810
Royal Society	Unknown
Coffey	810
Total (known)	3,243

The response rate to the online survey was 27% (862 responses), based on the known population of invited award holders (it may be less, depending on the number of invitations from the sources that did not disclose their population size).

**Table 11: Online survey responses by country**

Country	Total number of respondents
Brazil	118
Chile	15
China	52

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Colombia	36
Egypt	21
India	70
Indonesia	9
Kazakhstan	22
Kenya	-
Malaysia	34
Mexico	38
Philippines	22
South Africa	69
Thailand	35
Turkey	29
Vietnam	18
United Kingdom	274
<b>TOTAL</b>	<b>862</b>

The questionnaire was distributed online, and the questions were mostly quantitative in nature so that respondents could indicate which activities they had taken part in (which had been viewed as particularly useful or effective) and rate their level of agreement with statements about the Fund using Likert scales. The questions were analysed using simple response counts and frequency tabulations, cross-tabulated by country. They could not be weighted to match the population of award holders as no information on the total award holder population was available.

### A2.2.5 Telephone Survey of Newton Fund Award Holders

The telephone survey of Newton Fund award holders was launched in April 2018 with the objective of producing more information on the evaluation framework indicators. Out of the 862

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online survey respondents, 539 indicated that they would be willing to take part in a telephone follow-up (an opt-in rate of 63%).

The telephone survey was sub-contracted to an external multi-lingual telephone interview firm and was offered in multiple languages across all fifteen countries. The interviews were conducted using a structured questionnaire with questions designed to collect further qualitative information on the strengths and weaknesses of the Newton Fund and its impacts on activity – it was intended to probe deeper on issues identified in the online survey to provide more detail and nuance to the findings. The total number of interviews conducted from within this population was 204, with the country distribution set out below.

**Table 12: Telephone survey responses by country**

Country	Total number of respondents
Brazil	29
Chile	3
China	11
Colombia	11
Egypt	9
India	20
Indonesia	3
Malaysia	11
Mexico	9
Philippines	8
South Africa	21
Thailand	8
Turkey	9
United Kingdom	48

Vietnam	4
TOTAL	204

The survey questions were designed to gather information about recipients' professional experience of international research and innovation, and specifically to collect feedback on the Newton funding which had been received. These questions were more open-ended and qualitative in nature than the online survey, and the responses were transcribed and coded so that they could be analysed. The coding scheme was not pre-assigned but rather emerged from a study of the response to each question, thus distinguishing it from the online survey which mostly consisted of pre-coded, "tick-box" type questions.

#### A2.2.6 Thematic impact studies

The thematic in-country case studies were designed to give detailed qualitative information on a small, carefully-selected group of projects in eight of the Newton Fund countries. We sought to achieve a spread of Newton Fund delivery partners and activity types across the countries in the sample, while ensuring that each case study would exemplify the approaches and specialisms in each country. In consultation with BEIS it was agreed that the impact studies would be conducted in **China, Mexico, South Africa, Brazil, India, the Philippines, Egypt and Malaysia**.

The overall Newton funding profile was examined to identify the pillars, delivery partners, and sectors which were particularly concentrated in each country (in terms of the share of total funding), and to use this to produce a shortlist of larger activities in each country which exemplified that country's specialisms. The final selection of projects was designed to ensure a spread of activities covering as wide a range of pillars, sectors, and delivery partners as possible. The final selection of projects is provided below.

Country	Delivery Partner	Pillar	Project	Sector
Brazil	ESRC	Research	Joint Research Call - (Re)Connect the Nexus: Young Brazilians' experiences of and learning about food-water-energy.	N/A
	British Academy	People	Newton Advanced Fellowship: Global Nuclear Vulnerability: the effects of the Cuban Missile Crisis on British, French and Brazilian nuclear policies.	Other multisector
	MRC	Research	UK-Brazil Call in Neglected Infectious Diseases:	Health

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			The emergence of Zika virus in Brazil: investigating viral features and host responses to design preventive strategies.	
<b>China</b>	Met Office	Translation	Climate Science for Service Partnership-China (CSSP-China): Work Package 3 - East Asian climate variability and extremes	General environmental protection
	STFC	Research	Precision Agriculture for Family-farms in China (PAFiC)	Agriculture
	MRC	Research	Atmospheric Pollution & Human Health in a Chinese Megacity (APHH)	Health
<b>Egypt</b>	British Council	People	Institutional Links: Long Term Incarcerated Patients in Forensic Settings: Role of Research in Socioeconomic Enhancement (LIFE)	Health
	British Academy	People	Newton Fund Advanced Fellowship: Overcoming Deficiencies through Trustworthy Networks: A Comparative Study between the UK and Egypt Experiences in the Healthcare Sector	Health
	AHRC	Research	Sustainable Green markets, regenerating the urban historic core to sustain Socio-Cultural heritage and economic activities (SuS-MAR)	Other social infrastructure and services
<b>India</b>	BBRC	Research	Indo-UK Centre for Improvement of Nitrogen use Efficiency in Wheat (INEW)	Agriculture
	AHRC	Research	Community-led re-generation project	Other social infrastructure and services

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	NERC	Research	Sustaining Water Resources programme: Coupled human and natural systems environment for water management under uncertainty in the Indo-Gangetic Plain	General environmental protection
<b>Malaysia</b>	RCUK, InnovateUK	Translation	Malaysia Research and Innovation Bridges:  Next Generation Green Data Centres for Environmental and Business Sustainability	General environmental protection
	RAE	Translation	The Leaders in Innovation Fellowship	General environmental protection
	British Council	People	Malaysian Research Management and Governance	N/A
<b>Mexico</b>	British Council	People	Technology Transfer Best Practice and Skills Development Training for Practitioners	N/A
	Royal Society	People	Newton Advanced Fellowship: Distribution of arsenic on agricultural soils and its influence on exposure risks through maize ingestion and agricultural activities in Matehuala, San Luis Potosí, Mexico.	N/A
	Innovate UK	Translation	Development of an oral, thermostable enteric fever vaccine: saving lives and supporting tourism in Mexico	Health
<b>Philippines</b>	RAEng	Translation	Leaders in Innovation Fellowships Programme v3	Industry
	MRC	Research	ENSURE: Enhanced Surveillance for Control and Elimination of Malaria in the Philippines	Health

	BBSRC	Research	Developing Rice Resources for Resilience to Climate Change & Mitigation of Carbon Emissions	Agriculture
<b>South Africa</b>	STFC	People	Development in Africa with Radio Astronomy (DARA)	Other
	ESRC	People	The SASIE Network - The South African PhD Partnering Network for Inclusive Growth through Social Innovation and Entrepreneurship	Other
	AMS	People	Newton Advanced Fellowship: Drug induced liver injury due to anti-tuberculosis treatment - predictive mechanism based biomarkers and genetic associations	N/A

The case studies were resource-intensive. Preparation for the in-country research included a thorough document review on each country's research and development context, alongside the Baseline Report, Country Situation Note, and findings from the Process Evaluation. We also conducted a literature review of additional documentation on each country's science and innovation landscape, and existing collaboration activities with the UK. Project-specific documentation, such as application forms, mid-term and final reports were reviewed for each action included in the study, where provided by the delivery partner, local partners or researchers.

Each country was then visited for a week by a Coffey International or RSM UK researcher, accompanied by an in-country researcher recruited to assist full time with information gathering, travel, booking and facilitation of meetings etc. During the week long in-country visit, three main categories of stakeholders were interviewed:

- In-country delivery partners (and Newton in-country team)
- Funders;
- Participating award holders.

Each visit concluded with a workshop with local Newton Fund stakeholders (including those already interviewed) to present and sense check emerging findings and issues in a group setting.

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