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RESEARCH FOR DEVELOPMENT (R4D) INDICATORS: A REVIEW OF FUNDER PRACTICE

Final Report

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Acronyms and abbreviations

ACP	African, Caribbean and Pacific
BEIS	Business, Energy & Industrial Strategy
BMZ	German Federal Ministry for Economic Development Cooperation
BSU	Building Stronger Universities
CDR	Center for Development Research
CGIAR	Consultative Group for International Agricultural Research
CIDA	Canadian International Development Agency
COHRED	Council on Health Research for Development
CRS	Creditor Reporting System
DAAD	German Academic Exchange Service
DFID	Department for International Development
DP	Delivery Partner
EDF	European Development Fund
ERC	European Research Council
ESPA	Ecosystem Services for Poverty Alleviation
EU	European Union
FTE	Full-time Equivalent
GCI	Global Competitiveness Index
GCRF	Global Challenges Research Fund
GDP	Gross Domestic Product
GNI	Gross National Income
HEFCE	Higher Education Funding Councils of England
ICAI	International Commission for Aid Impact
ICT	Information and Communication Technology
IDRC	International Development Research Centre

IGC	International Growth Centre
ISP	International Science Programme
KCMC	Kilimanjaro Christian Medical University College
KCP	Knowledge for Change Program
KPI	Key performance indicator
LMIC	Low- and Middle- Income Countries
MoU	Memorandum of Understanding
NAS	National Academy of Sciences
NORHED	Norwegian Programme for Capacity Development in Higher Education and Research for Development
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organization for Economic Co-operation and Development
PCT	Patent Cooperation Treaty
PEB	Programme Executive Board
PEER	Partnerships for Enhanced Engagement in Research
PI	Principal Investigator
PSF	Policy Support Facility
R4D	Research for Development
R&D	Research and Development
R&I	Research and Innovation
REA	Rapid Evidence Assessment
REF	Research Excellence Framework
RG	Research groups
ROS	Research Outcomes System
RQ	Research Quality
SDC	Swiss Agency for Development and Cooperation

SDG	Sustainable Development Goal
Sida	Swedish International Development Cooperation Agency
SME	Small and Medium-sized Enterprises
SN	Scientific Networks
SNSF	Swiss National Science Foundation
STIP	Science, Technology, Innovation, And Partnerships
USAID	United States Agency for International Development
WB	World Bank
WEF	World Economic Forum

Executive summary

This review looks at the key performance indicator (KPI) practice of 14 research funds, as part of a process to develop KPIs for the UK government Global Challenges Research Fund (GCRF) and the Newton Fund. With the exception of the European Union's (EU) Horizon 2020, all of the funds are at least partially funded by official development assistance (ODA) for development impact in LMICs. Rather than looking at the more straightforward input/ output indicators, the review focuses on areas of measurement that are more challenging, and those that evidence shows are important for the success of research for development (R4D) change pathways. These include:

1. Challenge-oriented capabilities: Interdisciplinarity
2. Capacity building (institutional and individual)
3. Research partnerships and collaborations
4. Research communication and dissemination
5. Influence on policy and practice
6. Innovation outcomes and environments
7. Poverty alleviation and other development outcomes

This review uses the term 'research for development' (R4D) to categorise research that is funded through ODA, with the explicit aim that it should contribute to development outcomes (e.g. poverty reduction, social inclusion, economic growth and sustainable development) for people living in LMICs. The review assists in the development of GCRF and Newton Funds KPIs by enabling BEIS to position them in relation to other comparable R4D funds and programmes.

KPIs for R4D programmes

Each impact pathway in an R4D programme is likely to be highly context dependent, non-linear and take considerably longer than the time frame of an average 5-year development programme. Impact on social and economic development outcomes in LMICs is therefore likely to come about through a cumulative process of knowledge production and influence over time, often decades. As a result of the complexity of measuring research impacts for development, good practice is likely to be characterised by the following:

- **An emphasis on process:** indicators should be used to assess how the research project was developed from inception to completion, including the nature and types of relationships that were established, and the extent to which the research was 'positioned for use'.
- **A focus on learning and cumulative knowledge:** KPIs should be linked to a systematic approach to learning within the programme and its knowledge context.

- A KPI focus on the **sphere of direct control or influence**, leaving more remote spheres to either ‘aspirational targets’ or qualitative assessments that use case studies to explore the explanatory power of different causal mechanisms.
- **A clear connection between KPIs and their context** by tying them to the expected implementation space, where research will be used.
- **A theory-based approach**, where KPIs are developed all the way along the theory of change, allowing R4D programmes to test assumptions about the relationship between an intervention and its impact on development outcomes in LMICs.

Comparing practice with GCRF and Newton Fund KPIs

On the whole, this review of donor practice in R4D funds points towards a high degree of alignment with the KPI approaches taken by GCRF/Newton Fund across all of the seven indicator types. Where differences do occur, they tend to reflect divergence in programme theories of change: for instance, the GCRF and Newton Fund have a lesser focus on institutional capacity building in LMICs than a number of the funds reviewed here.

At the outcome and impact levels, the approaches taken by the International Growth Centre (IGC) and Consultative Group for International Agricultural Research (CGIAR) are worthy of further consideration. It is worth noting that, in both cases, these research centres benefit from long-term engagement in specific sectors and/or geographies. As a result, they are in a better position to demonstrate cumulative pro-poor impacts. In future, as the GCRF and Newton Funds develop more fine-tuned strategic focus in specific thematic areas, for example around the six GCRF ‘challenge areas’, they may consider using something like the CGIAR model of ‘aspirational targets’ tied to the United Nations Sustainable Development Goals (SDGs). Any adoption of such an approach, however, would have to be underpinned by recognition of the GCRF and Newton Fund’s more limited contribution to impact as a result of their shorter time frames. CGIAR, for instance, has been in operation since 1971 and the International Growth Centre (IGC) since 2008.

It is also suggested that going forwards, the GCRF and Newton Fund consider the adaptation of the International Development Research Centre’s (IDRC) Research Quality plus (RQ+) framework to ensure that its KPIs better capture key ‘positioning for use’ dimensions, including process indicators that track communication and dissemination strategies, as well as the quality of research partnerships, relationships with research users, and understanding of user contexts.

In summary, any next phase in BEIS’s ongoing efforts to strengthen the GCRF and Newton Fund accountability, learning and reporting systems might: (1) Consider using the IDRC RQ+ framework to ensure that ‘positioning for use’ dimensions are captured in the current GCRF/Newton KPI list. (2) As the strategic focus of both funds develops, consider the adoption of aspirational targets like CGIAR’s, which can be mapped onto the SDGs. And, (3) consider disaggregating innovation indicators so that they reflect ‘stages of innovation’, from research to uptake (as per CGIAR).

1 Introduction

Both the Global Challenges Research Fund (GCRF) and the Newton Fund aim to strengthen the UK's position as **world leader in international development** and **research** by ensuring that '*UK science takes the lead in addressing the problems faced by developing countries, whilst developing our ability to deliver cutting-edge research*' (BIS 2016). This is consistent with the guiding principle of the UK's Aid Strategy, '*that the UK's development spending will meet our moral obligation to the world's poorest and also support our national interest*' (HM Treasury and Department for International Development (DFID) 2015).

The Newton Fund and the GCRF are managed by the Department for Business, Energy and Industrial Strategy (BEIS) to promote research and innovation partnerships in selected partner countries. The Newton Fund has a budget of £735 million between 2014 and 2021, which is fully funded by official development assistance (ODA). It works with middle-income countries and operates on the basis of matched funding, with partner countries contributing similar resources to support the partnership. The Fund works in 17 countries, with half of the budget allocated for China, India, Brazil and South Africa (ICAI 2019a).

The GCRF is a £1.5 billion fund, running from 2016 to 2021. It was announced in 2015 to harness the expertise of the UK's research base to pioneer new ways of tackling global challenges. Its model stresses interdisciplinarity and building partnerships in developing countries. These principles signal an ambition '*to achieve a positive transformational impact on development research and on sustainable global development*' (BEIS 2017). The aim is to deploy UK research excellence in a strategic way to '*generate solutions to the most significant and complex problems faced by developing countries while at the same time strengthening their research capability*' (BEIS 2017).

The overarching rationale behind the GCRF and the Newton Fund is that **complex development challenges require new kinds of research and innovation**. The GCRF uses a set of challenge areas, based on the United Nations' Sustainable Development Goals (SDGs),¹ to provide an overarching framework for increasing the breadth and scope of research activities for development impact. The assumption is that new kinds of research and innovation are needed to tackle these challenges, including work that is interdisciplinary, mobilises multi-stakeholder partnerships across the global North and South, and across sectoral boundaries, to build lasting research and innovation capabilities and infrastructures in low- and middle-income countries (LMICs). Like the GCRF, the Newton Fund is one of several UK 'dual-purpose' ODA funds, designed to promote international development while at the same time supporting UK national interest (ICAI 2019b). This means that development objectives are paired with the goal of positioning the UK as a global leader on research and innovation, with a specific aim to build lasting ties between UK institutions and their LMIC counterparts.

¹ UN Sustainable Development Goals, at: <http://www.un.org/sustainabledevelopment/sustainable-development-goals/> (accessed 29 October 2019).

Monitoring, evaluation and learning in the UK's Research ODA

Funding large national research programmes through ODA brings **a high degree of scrutiny**. Since 2015, the UK government has made a legal commitment to invest 0.7 per cent of gross national income (GNI) on ODA and for each subsequent calendar year. More recently, ODA spending has begun to shift from DFID to other government departments: 5 years ago, DFID accounted for 88.6% of UK ODA, falling to 71.9% by 2017, while other government departments almost doubled their proportion over the period, from 9.4% (2013) to 18.3% (2017). Of this contribution, the largest non-DFID 'departmental' share of ODA was from BEIS, at 5.4 per cent (DFID 2018). To meet BEIS' legal requirements for the use of ODA, it is necessary to comply with internationally agreed definitions,² most notably the need for it to directly address poverty and gender inequality.

In addition to the regular lines of scrutiny (such as departmental reporting to HM Treasury, and the National Audit Office studies), the **International Commission for Aid Impact** (ICAI) provides specific scrutiny for the UK's aid spend. ICAI reports to Parliament through the House of Commons' International Development Committee. Departments with new or increased aid budgets have made efforts to strengthen their systems and capability to meet eligibility, transparency and best practice requirements of UK ODA. In a recent ICAI review of 'How UK Aid Learns' (2019b), however, challenges are raised about the UK's aid expenditure outside of DFID. While progress has been made, ICAI finds that aid-spending departments have some way to go in 'building a culture of evidence-based decision making' in order to more effectively manage their aid portfolios (ICAI 2019b).

In September 2017, ICAI published a review of the GCRF. One of its recommendations was that: 'BEIS should develop a results framework for assessing the overall performance, impact and value for money of the GCRF portfolio, drawing on DFID's guidelines on value for money in research and evidence programming' (ICAI 2017). In 2019, ICAI conducted a follow-up review (ICAI 2019c) on the government's response to the recommendations it made in the 2017 review of the GCRF. It reported that progress had been made by the GCRF and its delivery partners across all of the review's recommendations. A remaining gap, however, is the 'oversight and accountability function of the Fund', which the review proposed requires further steering and leadership within BEIS. Similar recommendations were made in the 2019 ICAI performance review of the Newton Fund (ICAI 2019a), where it was recommended that BEIS strengthen the Fund's accountability and value for money frameworks in order to achieve 'development impact at a scale and ambition proportionate to the level of ODA spending' (ICAI 2019c).

As part of an ongoing process to address the ICAI's recommendations to strengthen GCRF and Newton Fund accountability systems and frameworks, Itad has been working in collaboration with Technopolis and Kings College London to undertake the Foundation stage for the evaluation of the GCRF (Barr *et al.* 2018). This includes a theory of change, a process evaluation and an evaluation strategy. Subsequent work has also supported BEIS to develop key performance indicators (KPIs) for both GCRF and the Newton Fund, and as part of this assignment, this report provides a rapid review of comparable research funds.

² ODA is produced according to the definitions and methodologies of the Organisation for Economic Cooperation and Development (OECD).

1.1 Research aims and questions

The project aims to support the development of KPIs for two research programmes: the Global Challenges Research Fund (GCRF) and the Newton Fund. Both of these funds are financed by UK official development assistance (ODA). GCRF and Newton Fund KPIs therefore need to be able to support the measurement of research quality in terms of both its:

1. Scientific rigour/academic influence, and
2. Impact on the lives of poor people in low and middle-income countries (LMICs).

Throughout this report we use the term ‘research for development’ (R4D) to categorise research that is funded through ODA, with the explicit aim that it should contribute to development outcomes (e.g. poverty reduction, social inclusion, economic growth and sustainable development) for people living in LMICs. This review will assist in the development of GCRF and Newton Fund KPIs by enabling BEIS to position them in relation to other comparable R4D funds and programmes (i.e., its peers).

Aim: To identify comparable research funds that use KPIs to monitor research for development impact. This will help BEIS to position the GCRF and Newton Fund indicator development in comparison with others working in this field.

Key questions:

1. What are other funds/funders doing on indicators to assess research for development?
2. How does this compare to the KPI status of GCRF and Newton Fund?

Intended use: To be published as an independent assessment, which could be subsequently referenced by staff of BEIS.

In line with evidence-based practice, PICOC³ is a method used to describe the five elements of a searchable question. See Table 1 for how this applies to this study.

Table 1: Defining the user context using PICOC

Population	BEIS: the GCRF and the Newton Fund
Intervention	KPIs used to measure the impact of ODA-funded research for development
Comparison	The KPI practice of other key donors compared to the GCRF and the Newton Fund
Outcome	Appropriate KPIs for research for development
Context	Donors of ODA-funded research for development

³ This model is recommended in: Barends, E., Rousseau, D.M. & Briner, R.B. (Eds). (2017). CEBMa Guideline for Rapid Evidence Assessments in Management and Organizations, Version 1.0. Center for Evidence Based Management, Amsterdam.

1.2 The UK's research aid

As shown in Figure 1, between 2012 and 2017, the UK spent almost as much of its ODA on cross-sector research⁴ annually, on average, as the next nine largest research funders combined. In 2017, the UK's spend on 'research/scientific institutions' accounted for over 50 per cent of the total for all official donors combined.⁵ While research as a share of UK ODA has been increasing since 2009, it rose sharply after 2014. This coincided with the UK's 2015 Aid Strategy, which made explicit the intention to increase the UK's spending on research. Much of this increased spending can be attributed to the rise in prominence of new actors in the UK's aid bureaucracy, most notably BEIS, whose aid expenditure increased five-fold between 2012 and 2017 (Robinson *et al.* 2019).

As a major funder of R4D, the UK is in a unique position to contribute to pro-poor innovation and learning across the globe. At the same time, increased spending on research across different government departments poses specific challenges for the management of the UK's aid budget. In addition to the managerial challenges raised by ICAI (ICAI 2019abc), demonstrating the relationship between research and societal or economic impacts is not a straightforward task, particularly within the time frame of a typical five-year research project or programme.

Research outputs often have complex, indirect and highly contingent relationships with higher-level development impacts. Moreover, research and development funders may have different conceptions of 'impact', which can result in varying expectations in terms of measuring the quality and performance of research programmes. Such factors mean that developing results frameworks for R4D programmes inevitably involves trade-offs between what a programme would like to measure and what it is *able to* measure. The relationship between the desirability and efficacy of KPIs requires careful consideration and management in R4D programmes. This review aims to contribute to the development of KPIs that will enable BEIS to transparently demonstrate the role of the GCRF and Newton Fund in promoting pro-poor outcomes in LMICs, while being sensitive to the inherent challenges associated with measuring non-academic research impacts. These challenges are discussed in more detail in Section 3 (Conceptual Framing) of this review.

⁴ This review uses data from the OECD Creditor Reporting System (code 43082: 'Research/Scientific Institutions') to capture ODA-funded research for development. This provides a dataset to compare across different funders, although it is recognized that ODA-funded research ODA is also reported under a number of different sector-specific codes in the CRS.

⁵ OECD Creditor Reporting System (CRS).

2 Method

In order to be sufficiently robust and transparent, the review followed an adapted version of a rapid evidence assessment:⁶ this provided a set of core principles and a more structured approach to conducting a literature review, while at the same time offering greater flexibility and reflexivity in the process.⁷ The latter is particularly appropriate given that the relevant evidence on R4D use of KPIs is likely to exist predominantly outside of formal peer-reviewed channels. The identification of relevant material was therefore conducted through a combination of expert advice and snowball sampling.

2.1 Search strategy

While more typically a search strategy would involve identifying relevant academic databases and journals, in this case there was a limited pool of relevant organisations (i.e. large organisations with broad portfolios of research for the development field). The review therefore focused on the identification and assessment of practice in a few key funders and donors of research for development (R4D). The identification of R4D donors of focus was done through a systematic approach using the Organization for Economic Co-operation and Development's (OECD's) creditor reporting system (CRS), which was supplemented with insights from key informants with expertise and R4D and its evaluation.

The review focused its assessment of KPI practice on the largest ODA funders of 'research/scientific institutions' in the last 5 years (2012–17). See Figure 1. To supplement this systematic approach, key informants⁸ were also asked to make suggestions of relevant R4D programmes as examples of innovative or good practice in the area of KPIs. This supplementary approach yielded five further examples: the EU's Horizon 2020; the Swiss R4D programme; CGIAR; the IDRC's RQ+ Framework; and DFID's support to the International Growth Centre (IGC). The KPIs were retrieved through a combination of reviewing donor annual reports and programme evaluations; interviewing experts; searching institutional websites and databases.

Finally, the review also included a rapid assessment of the literature addressing broader questions about how to interpret and measure impact in R4D programmes. This helped position this assessment within a broader conceptual framework; it addressed three questions:

1. What is 'impact' in research for development?
2. How is impact in research for development likely to come about?
3. Are there specific challenges for KPI practice in research for development?

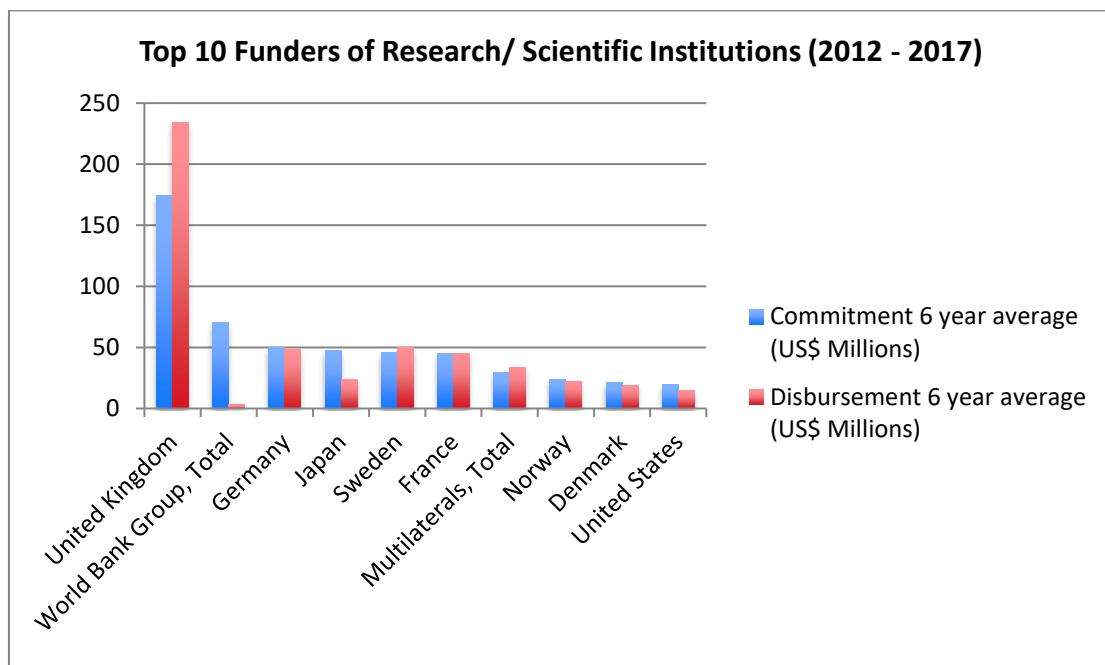
⁶ A rapid evidence assessment is a toolkit that was developed by the civil service, and similar to the one outlined for international development by Hagen-Zanker *et al.* (2013) *How to do a rigorous, evidence-focused literature review in international development: A guidance note*, Working Paper, Overseas Development Institute, London, UK.

⁷ This will provide a robust assessment, although it will not have the wider systematic search and therefore the increased confidence that comes from excluding and screening large numbers of formal /grey literature that is undertaken for a systematic review.

⁸ See full list of Key Informants in Annex C.

In addition to the literature search, insights from the key informants were used to answer these questions. It should be noted, however, that the focus of this review is on KPI practice, with the aim of comparing GCRF and Newton Fund indicators with their peers in the R4D field. This part of the review was therefore not extensive; it was designed to frame, rather than inform, the findings.

Figure 1. Top funders of Research/ Scientific Institutions



Source: OECD Creditor Reporting System

2.2 Retrieval and screening

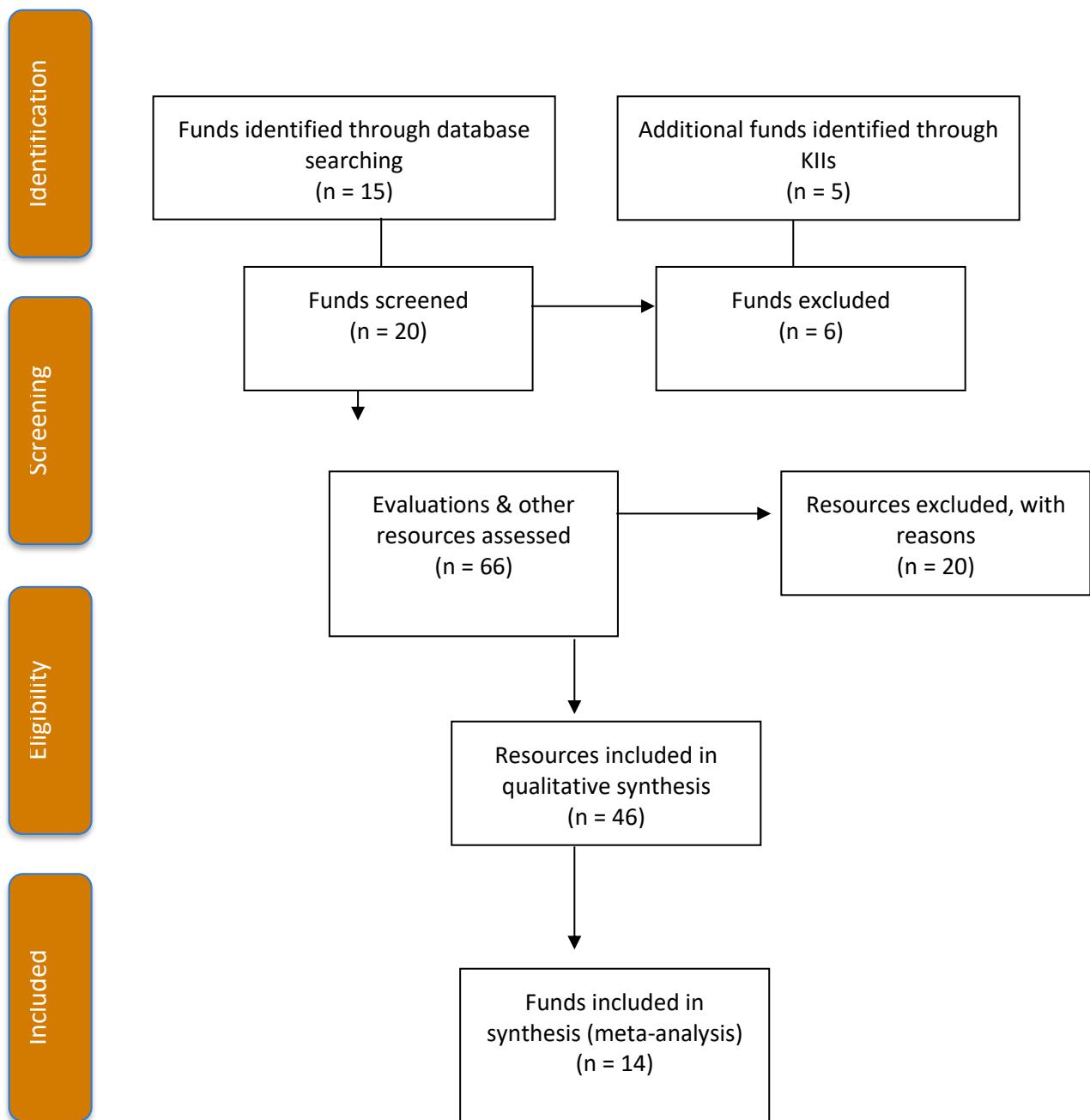
Once the donors of focus had been established, documents relating to their R4D practice were screened against the exclusion/inclusion criteria laid out in Annex B. Attention was paid to the comparative relevance of programme theories of change and objectives for the GCRF and Newton Fund. However, a large contributing factor in the final selection of comparable funds/programmes was the public availability of indicators. The source of indicators for each fund/programme is shown for each in Annex A. In most cases, indicators were extracted from publicly available programme evaluations and reviews.

The reliance on publicly available indicators in programme evaluations or impact reports means that there are some gaps in the data. Most significantly:

- It is likely that not all examples reflect full results frameworks. This is more apparent in some cases (e.g. Sida International Science Programme (ISP)) than others.
- It was not possible to find example indicators for all of the donors reviewed. Specifically, the donors of Japan and France do not have research fund examples included in this review.

The process of retrieval and screening is presented in Figure 2. The final set of fund examples and their donors is presented in Table 3.

Figure 2. Retrieval and screening⁹



⁹ Model adapted from: Moher, D., A. Liberati, J. Tetzlaff and D.G. Altman, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097, at: <http://prisma-statement.org/documents/PRISMA%202009%20flow%20diagram.pdf>

2.3 Appraisal and synthesis of evidence

Each fund was then assessed in terms of the extent of its comparability with the GCRF and Newton Funds. Not all of the funds are comparable in their entirety. In some cases, divergence in KPI practice simply reflects a different programme focus or theory of change. This is particularly the case for funds that focus on the provision of scholarships or capacity building in LMIC academic institutions, which is only one component of the GCRF's theory of change. As a result, programmes such as Norad's NORHED understandably have more indicators for measuring changes in institutional and research capacity in LMICs. In order to ensure that KPI comparisons were meaningful and relevant, in each case 'notable KPI practice' has been highlighted. These are areas of measurement focus that are of relevance to the GCRF and Newton Fund theories of change and were used as the parameters for comparison in the main synthesis (Section 4). In this respect, the funds were finally compared with the GCRF and Newton Fund according to the following indicator types:

- Challenge-oriented capabilities: interdisciplinarity
- Capacity building (institutional and individual)
- Research partnerships and collaborations
- Research communication and dissemination
- Influence on policy and practice
- Innovation outcomes and environments
- Poverty alleviation and other development outcomes

The outcome of this process of synthesis and assessment is presented in Section 4.

3 Conceptual framing

3.1 What is impact?

In order to identify the ‘right’ indicators for measuring the quality and impact of research for development (R4D), it is necessary to establish what impact might look like in this context. The definition is clearly dependent on the nature of a programme’s goals and the context in which the research is intended to have impact. It is possible, nonetheless, to establish certain types of impact that are likely to be of relevance and importance for assessing the quality of R4D programmes and funding streams.

First and foremost, if research is funded by official development assistance (ODA), then it necessarily complies with the Organization for Economic Co-operation and Development (OECD) standards, having ‘the promotion of the economic development and welfare of developing countries’ as its *main objective* (OECD 2019). This means that the effectiveness of R4D will be measured ultimately in terms of its impact on development outcomes in LMICs. The OECD-DAC definition of impact is: ‘positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended’.¹⁰ In the UK, the Independent Commission for Aid Impact defines impact as: ‘long-term, transformative change for poor people, who are the intended beneficiaries of UK aid’ (ICAI 2015).

The nature of ODA funding requirements means that R4D diverges significantly from the impact expectations placed on standard academic research, which, in the UK, is assessed by the ‘Research Excellence Framework’ (REF).¹¹ Since 2014, the REF has included a component on ‘impact’, which the Higher Education Funding Councils of England (HEFCE) define as ‘an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia’.¹² In 2014, this non-academic impact component makes up 20% of the REF’s overall assessment, with the largest weightage placed on academic indicators: the quality of research outputs (65%) and the quality of the research environment (15%) (Chowdhury *et al.* 2016).

This means that, even with the post-2014 REF focus, the expectations in terms of societal and economic impacts placed on standard academic research are much lower than ODA compliance requires. Research is assessed primarily based on its academic quality through publication, which is by no means an inevitable or straightforward route to pro-poor impacts.

ODA-funded research therefore faces the specific challenge of reconciling the various ways in which research quality can be assessed, both academic and non-academic (Murray & Izzi 2019; Harris 2015). This can lead to measurement problems in R4D programmes, as different types of funders place emphasis on different types of impact. As shown in the Ecosystem Services for Poverty Alleviation (ESPA) programme (Box 1), aid agencies such as DFID are naturally geared towards expecting programmes to show ‘demonstrable improvement in the

¹⁰ OECD-DAC (2013) ‘Development Results: An Overview of Results Measurement and Management – A Briefing Note’ <https://www.oecd.org/dac/peer-reviews/Development-Results-Note.pdf> (accessed 29 October 2019).

¹¹ ‘What is the REF?’, at: <https://www.ref.ac.uk/about/what-is-the-ref/>

¹² REF Impact, at: <https://re.ukri.org/research/ref-impact/> (accessed 29 October 2019).

lives of poor communities'. Research councils, on the other hand, are more attuned to academic conceptions of impact and place less emphasis on reporting requirements of this kind.

Box 1. Defining Impact in the Ecosystem Services for Poverty Alleviation Programme (ESPA)

ESPA was the first major collaboration between DFID, NERC and ESRC, and, as such, a testing ground to reconcile and operationalise the two notions of 'development' and 'academic' impact. Not surprisingly, the three funders had different views on impact, at least in the early years of the programme. Having been at the forefront of the promotion of impact and impact evaluation as part of the evidence-based policy and value for money agenda, DFID envisaged ESPA's impact as a demonstrable improvement in the lives of poor communities in the countries where projects were undertaken. The two Research Councils, on their part, were more attuned to academic notions of impact, and had less stringent requirements in terms of timeline and attribution.

These different perspectives had implications for what was expected from projects in relation to level of impact and timescale, and the guidance provided to researchers. As a result, many ESPA researchers felt that 'impact' was a moving target, particularly in the early phases, with expectations and priorities often shifting considerably during the lifetime of a single project. According to DFID's EPR, this difference of views among funders was 'perhaps ESPA's most significant challenge [...] a complex issue that ESPA has struggled with at a programme as well as a project level, and to some extent it remains unresolved'. One interviewee of the EPR team poignantly summarised the dilemma of reconciling 'academic impact' and 'development impact': 'the whole idea of research is that you don't know the answer. The whole idea of aid is to deliver the answer.'

Source: ESPA Working Paper No. 8 (2018) 'Research with Development Impact: Lessons from the Ecosystem Services for Poverty Alleviation programme', p. 11.

A second challenge is posed by the complexity of measuring the societal and economic impacts of research. In terms of development impact, investing in research is often considered to be of benefit to LMICs via the following pathways:

- Driving economic growth.
- Increasing research capacity and human capital.
- Developing pro-poor products and technologies.
- Informing the development of policies and practice (DFID 2014).

The relationship between research outputs and such higher-level impact is, however, complex and often highly contingent upon factors that are beyond the control, or even influence, of individual research programmes. For instance, in the case of policy outcomes, the dynamic and non-linear nature of policy change means that it is very difficult to determine causality in the relationship between research outputs and any subsequent policy outcomes (IDS 2013; Pellini *et al.* 2012; UKRI/USAID 2018). Impact at this level is likely to be the result of

cumulative processes that take place over long periods of time (Gunn & Mintrom 2017), and result from the actions of a number of different actors and interventions.¹³

Before reaching this higher-level change, therefore, there are likely to be intermediate effects, events and other outcomes of significance along the impact pathway, as, for example, reflected in the GCRF theory of change.¹⁴ Indeed, the challenges associated with measuring impact in R4D programmes mean that a KPI focus is most sensibly weighted towards the output level, or outcomes within the sphere of more direct influence, like research capacity building efforts or collaboration between researchers and intended users.

In defining the impact and quality of research, attention should also be paid to the process through which research projects are executed, from inception to completion. As reflected in the IDRC RQ+ framework (Ofir *et al.* 2016), the quality of the research process can be an indicator of its potential impact on development outcomes in LMICs, even if change at this level is not measurable within the time frame of a project. In the RQ+ framework, for example, key factors determining the success of R4D are the extent to which the research has been ‘positioned for use’ (*Ibid.* 2016). This can be seen in: the quality of collaboration between researchers and intended users in LMICs; the extent to which R4D programmes are addressing high-demand issues in the user context; how well user contexts have been understood and engaged with; and the extent to which researchers from LMICs are leading the process.

In sum, given the complexity of defining research ‘impact’, the most useful conceptual starting point is likely to be the broadest. For example, the ESRC/DFID Programme for Poverty Alleviation uses a definition that encompasses both academic and non-academic impact, including instrumental effects on the development of policy and practice; conceptual impacts that reframe debates or contribute to new understandings of policy issues, and impacts on research capacity.¹⁵ As shown in Table 2, this forms the basis of the Overseas Development Institute’s (ODI) Research Excellence Framework Toolkit definition of research impact, with the addition of ‘enduring connectivity’ (Tilley *et al.* 2018). The latter points towards the importance of a systems lens, which recognises that global development challenges are often complex, requiring collaboration and interactions across disciplines, sectors and geographies.

Table 2: Different types of impact¹⁶

Conceptual	Impacts on knowledge, understanding and attitudes
Instrumental	Impacts on changes in policy and practice
Capacity building	Impacts on the ability of researchers to conduct similar work in future
Enduring connectivity	Impacts on the existence and strength of networks of people and organisations who understand and can make use of the research

¹³ See: Pritchett, L. (2017) ‘The Perils of Partial Attribution: Let’s All Play for Team Development’, at: <https://www.cgdev.org/publication/perils-partial-attribution>

¹⁴ GCRF Theory of Change, at https://www.researchgate.net/figure/GCRF-Theory-of-Change_fig2_333930171

¹⁵ ESRC-DFID Joint Fund for Poverty Alleviation Research Guiding principles on uptake, impact and communication of research, at: <https://esrc.ukri.org/files/research/international/guiding-principles-on-uptake-impact-and-communication/>

¹⁶ ODI REF toolkit (March 2018).

3.2 How does research have impact?

Particularly in the UK context, research for development programmes have tended to follow a typical ‘research-into-use’¹⁷ theory of change, whereby research is produced and disseminated to ‘research users’, eventually leading to impact via a number of steps:

- Research production and publication.
- Research uptake: users are made aware of and engage with research, e.g. through attending dissemination events.
- Research-into-use: users apply research to improve or develop new policy and practice.
- Change in awareness, attitudes or perceptions through dissemination of new ideas and knowledge.
- Impact on longer-term development outcomes for poor people in LMICs (Murray & Izzi 2019).

However, as discussed, each impact pathway is likely to be highly context dependent, non-linear and take considerably longer than the time frame of an average 5-year development programme. It is important, therefore, to be aware of the conditions that are likely to contribute to the success or otherwise of ‘research-into-use’ change pathways. The interviews¹⁸ and literature reviewed in this component of the study pointed towards the following ‘interlocking conditions’ (Harris 2015):

- The explicit **intention to influence policy and practice** on the part of researchers.
- The production of **high-quality research**, by scientific standards.
- **Academic incentive and reward systems** that promote social and economic impact (Harris 2015).
- **Researcher engagement with the political context** of their work and the intended user context (Ofir *et al.* 2016).
- **Demand for knowledge** in the user context (Ofir *et al.* 2016; Carden 2009).
- **Capacity for research uptake** and application in the user context (Carden 2009).
- The **effective communication** of research results to wider audiences, including the public, civil society and policy-makers (Harris 2015; Pellini *et al.* 2012; Brown *et al.* 2018).
- **Relationships:** effective engagement with user stakeholders in the process of knowledge production and sharing, including through intermediaries and ‘knowledge brokers’ (Harris 2015; Brown *et al.* 2018).

¹⁷ DFID ‘Research-into-Use’ – A Short Guide, at: <https://www.gov.uk/dfid-research-outputs/research-into-use-a-short-guide>.

¹⁸ See Annex C for full list of key informants.

3.3 What does this mean for KPI practice in R4D programmes?

A rapid review of the literature and insights from the key informants point towards a number of important considerations when developing KPIs for R4D programmes. As a result of the complexity of measuring research impacts for development, good practice is likely to be characterised by the following:

- **An emphasis on process:** indicators should be used to assess how the research project was developed from inception to completion, including the nature and types of relationships that were established, and the extent to which the research was ‘positioned for use’.
- **A focus on learning and cumulative knowledge:** KPIs should be linked to a systematic approach to learning within the programme and its knowledge context. Recognising that change as a result of research is likely to come about through a cumulative process over time, performance indicators need to be sensitive to the contribution a programme makes to cumulative knowledge.
- A KPI focus on the **sphere of direct control or influence**, leaving more remote spheres to either ‘aspirational targets’¹⁹ or qualitative assessments that use case studies to explore the explanatory power of different causal mechanisms. Performance indicators should reflect modesty and realism about what a research intervention can achieve, and the time frame in which it can achieve it.
- The **contextualisation of KPIs**, by tying them to the expected implementation space, where research will be used. In practice, this means developing performance indicators through a consultative process that draws on the knowledge and perspectives of different actors in the research-into-use change process, including funders, academics, policy-makers and implementers.
- Finally, given the complexity of change processes in R4D programmes, a **theory-based approach** is recommended, where KPIs are developed all the way along the theory of change, allowing R4D programmes to test assumptions about the relationship between an intervention and its impact on development outcomes in LMICs.

¹⁹ For example, in the Consultative Group for International Agricultural Research (CGIAR) results framework discussed in Section 4.

4 Findings

This section first provides an overview of the selected funders/funds for comparison, ranging from bilateral funders such as Sida and Norad, through to multilateral donors and funds like the EC and CGIAR. The remainder of the section groups key findings under seven main domains of impact: (1) Partnerships and collaboration; (2) Capacity building; (3) Research communication and dissemination; (4) Interdisciplinarity; (5) Influence on policy and practice; (6) Innovation outcomes and environments; and, (7) Poverty alleviation and other development impacts.

4.1 Overview of the funds

Of the 20 funds and programmes reviewed, a final 14 were chosen for comparison with the GCRF and Newton Fund indicators. An overview of the funds is presented in Table 3. At the highest level of programme, and therefore performance indicator, focus the funds can be split into two main groups:

1. Those that focus on research and academic capacity building at the individual or institutional level, predominantly in LMICs.
2. Challenge-led funds that aim to solve global development challenges; strengthen innovation and/or market systems through investing in research and research partnerships.

Figure 3. Measurement focus of funds

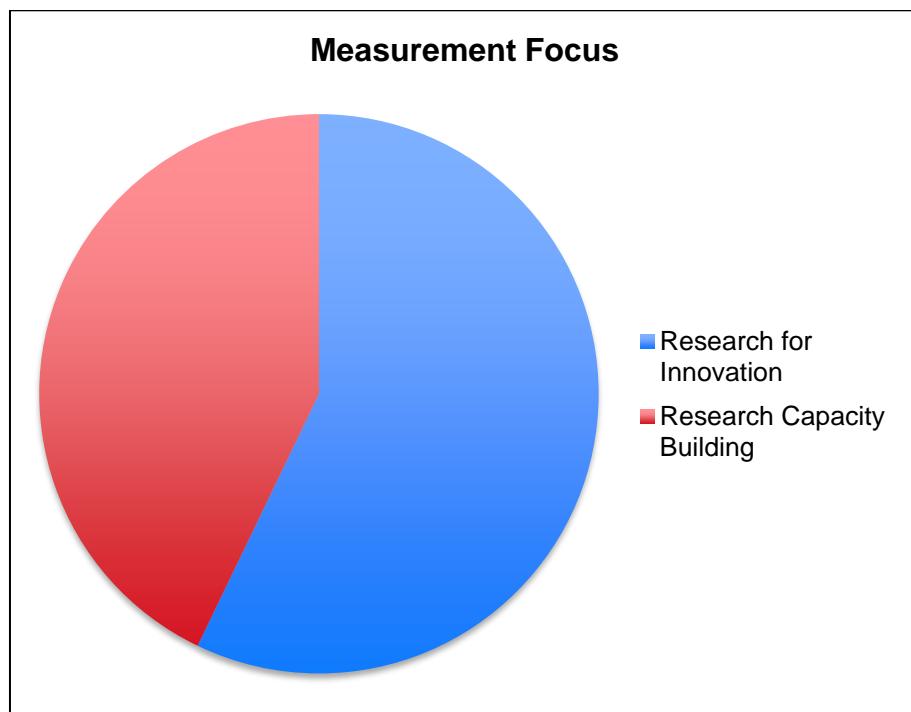


Figure 3 shows that most of the funds fall more firmly into the second category. These funds may include a research capacity building component, but it is not their primary focus or goal,

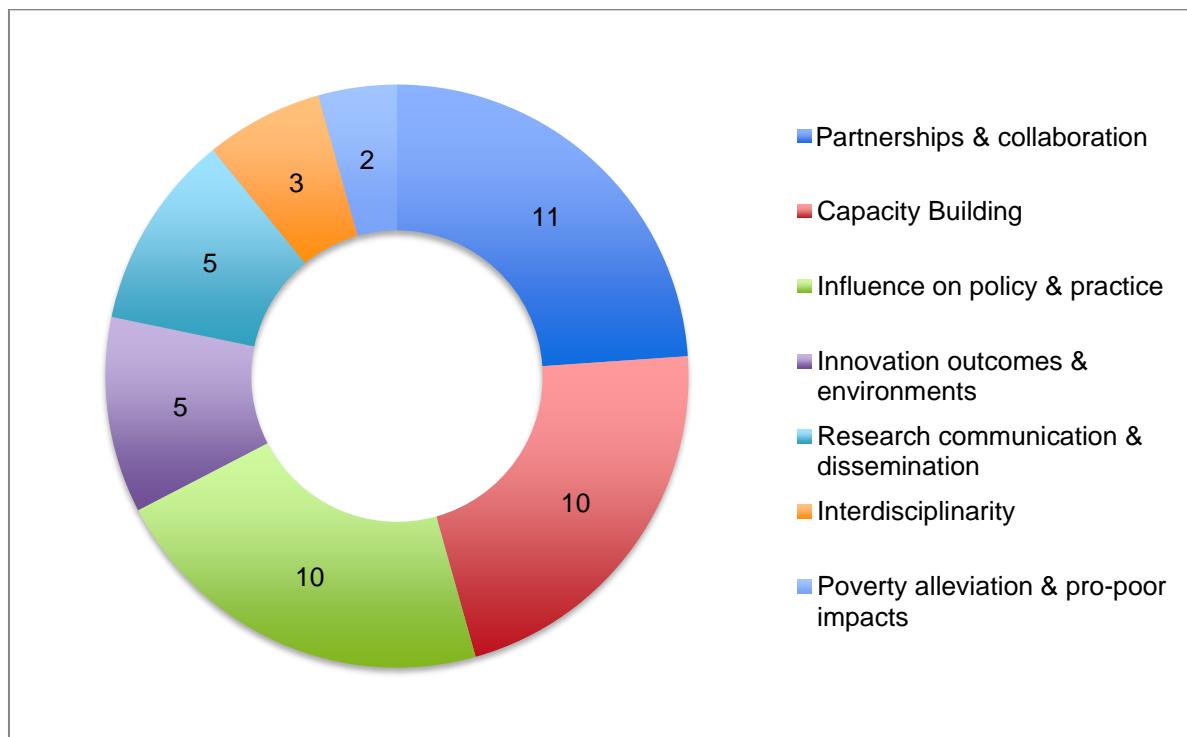
more often a step towards it. The GCRF and Newton Funds would both fit into this second category.

Table 3: Overview of funds

	Fund/programme	Donor
1	APC-EU Programme	EC
2	Building Stronger Universities Programme (BSU)	Danida
3	Consultative Group for International Agricultural Research (CGIAR)	Various
4	German Academic Exchange Service (DAAD)	BMZ
5	Ecosystem Services for Poverty Alleviation (ESPA)	DFID, NERC & ESRC
6	Horizon 2020	EC
7	IDRC RQ+ Framework	CIDA/Various
8	International Growth Centre (IGC)	DFID
9	International Science Programme (ISP)	Sida
10	Knowledge for Change Programme (KCP)	Various
11	Norwegian Programme for Capacity Development in Higher Education and Research for Development (NORHED)	Norad
12	Partnerships for Enhanced Engagement in Research (PEER)	USAID
13	Swiss Research for Development Programme (r4d)	SDC
14	US Global Development Lab	USAID

In terms of the indicator types being compared with the GCRF and Newton Fund, most funds included indicators for research capacity building; research partnerships and collaborations, and influence on policy and practice. The lowest number of funds included specific indicators for measuring interdisciplinarity (N=3) and pro-poor development impacts (N=2). The latter is most likely to be a reflection of the challenges associated with measuring impact at this higher level in R4D programmes. The number of funds by each indicator type is presented in Figure 4.

Figure 4. Funds by indicator type



4.2 Qualitative synthesis and analysis

The synthesis that follows presents the most common KPI approaches taken by the funds, as well as examples of good practice. It then compares the indicators of other funds with those of the GCRF and Newton Fund. It is organised by indicator type (see Figure 4), which have been chosen on the basis that:

1. They are comparable with the GCRF and Newton Fund because they **reflect key aspects of their theories of change** or objectives.
2. They pick up on what the conceptual framing literature and interviews indicated in terms of **good practice for KPIs in R4D programmes**. These include process indicators that are linked to the research-into-use change pathway, for instance those that measure relationships, communication and dissemination strategies: aspects of what the IDRC RQ+ framework calls ‘positioning for use’.

The GCRF and Newton Fund indicators that were used for the comparative aspect of this synthesis was: ‘KPI Shortlisting Scoring Sheet – October 2019’. It is recognised, therefore, that findings from this review will inform the final shortlisting of the KPIs, which is currently under way. The synthesis is presented in an order that reflects an R4D change pathway, moving from direct to indirect spheres of influence.

4.2.1 Partnerships and collaboration

Partnerships and collaboration, alongside capacity building, was the most commonly occurring indicator type in the funds reviewed. The indicators encompassed a broad range of partnership types, including networks and policy/industry collaboration, as well as research partnerships that indicate collaboration across geographies. As with other comparison parameters, some

funds had a greater emphasis on partnerships and collaboration, depending on the theory of change and programme goals. For example, the Swiss r4d programme had a strong indicator focus in this area. Partnerships and collaboration was most commonly (N=10) measured quantitatively **as the number of new or continuing partnerships**, i.e. ‘level of participation’. For example:

1. Level of university/industry research collaboration (EU Horizon 2020).
2. Number of CGIAR partnerships.
3. Number of PEER research collaborations/awards (PEER, USAID).
4. Number of triangular North-South-South collaborations. (Swiss r4d).

Common approaches also used **co-production of inputs or outputs**, for example co-creation of research products as an indicator of the level of collaboration. Some of the indicators in this category therefore overlap with those under interdisciplinarity, specifically those that indicate the co-production of outputs across disciplines. Examples include:

1. Number of joint public-private publications (Horizon 2020).
2. Number of co-authored scientific publications with authors from social and natural sciences (Swiss r4d).
3. Number of Phase 2 commissioned research or country studies to be authored or co-authored by ‘local researchers’ (cumulative) (DFID IGC).
4. Knowledge transfers within South-South and South-North networks and partnerships (NORHED, Norad).
5. Total USAID mission obligations (in millions of dollars) to partnerships with a minimum of 1:1 private sector leverage for a given fiscal year (US Global Development Lab).

Finally, better practice also uses measures for the **quality of partnerships and collaboration**, for example the Swiss r4d programme indicator: ‘Degree of compliance with 11 KFPE partnership principle’. The 11 principles are designed to assess the quality of ‘transboundary and intercultural’ research partnerships, which are based on a ‘continuous process of sound knowledge generation, building mutual trust, mutual learning and shared ownership’. The 11 KFPE qualitative indicator types in research partnerships are:

1. Setting the agenda together
2. Interacting with stakeholders
3. Clarifying responsibilities
4. Accounting to beneficiaries
5. Promoting mutual learning
6. Enhancing capacities
7. Sharing data and networks
8. Disseminating results

9. Pooling profits and merits

10. Applying results

11. Securing outcomes²⁰

The IDRC RQ+ framework overlaps with a number of the principles picked up in the Swiss r4d qualitative focus on partnership principles, under its '**research legitimacy**' dimension. In particular the framework acknowledges the potentially negative consequences of unequal power relationships in transnational research partnerships and attempts to support programmes in mitigating these. The framework defines research legitimacy as:

*'...the extent to which research results have been produced by a process that took account of the **concerns and insights of relevant stakeholders**, and was deemed procedurally fair and based on the values, concerns and perspectives of that audience. Legitimacy deals primarily with **who participated and who did not**; the process for making choices; how information was produced, vetted and disseminated; **how well knowledge was localized**, and if it respected local traditions and knowledge systems. This dimension also includes a subdimension that asks the assessor to consider the **potentially negative consequences** and outcomes for populations affected by the research, gender-responsiveness, inclusiveness of vulnerable populations, and engagement with local knowledge.'*

Comparison with the GCRF/Newton Fund

The GCRF and Newton Funds use a similar approach to measuring the level of collaboration with indicators that count the number of interactions, or new partnerships. They also combine this approach with indicators that use the co-production of outputs, for example co-creation of research products, to indicate the extent of collaboration. The GCRF is also interested in sustainability of its research partnerships and therefore also includes indicators for further funding. The level of demand in user/LMIC contexts is also important for the GCRF/Newton Funds, which for the Newton Fund is captured by the 'number of new MoUs signed between the UK and partner countries'.²¹ Other GCRF/Newton examples include:

- **Number of new instances of brokered organisational links** attributed to involvement in the funds per financial year per delivery partner (DP). Broken down by country and types of institutional link (e.g. research/innovation, commercial, advisory).
- **Number of co-authored research publications addressing local development needs** and challenges flowing from the Newton Fund, per financial year, by country.
- **Number of formal networks created through Newton Fund activities** (with UK and partner country participation) and areas covered, per financial year, by country.

Despite the emphasis on equitable partnerships in the Funds, however, there are no apparent indicators for measuring the quality of research partnerships. At present, it is likely that this

²⁰ KFPE Guide to Transboundary Research Partnerships:

https://naturalsciences.ch/organisations/kfpe/11_principles_7_questions

²¹ Although some Delivery Partners have questioned the usefulness of this measure.

level of assessment will be left until the evaluation stage, using an approach such as COHRED's Research Fairness Initiative.²²

4.2.2 Capacity building

Approximately two-thirds of the funds reviewed included indicators for capacity building. Most commonly, these indicators use **training events/participation and qualifications/professional positions** as proxies for capacity. For instance:

1. Number of civil servants from requesting institutions trained, disaggregated by sex (African, Caribbean and Pacific–European Union (ACP–EU) Programme).
2. Number of People trained by CGIAR in 2017 (CGIAR).
3. Number of capacity-strengthening events organised for ESPA Fellows by the ESPA Directorate and their outcomes (ESPA, DFID).
4. Number of academic staff with strengthened qualifications (Master/PhD) by relevant institutional level (institute/department/faculty) supported by NORHED (Norad, NORHED).

Some funds, particularly those that are more focused on research capacity building in LMICs, included **institutional capacity indicators** that attempt to measure research infrastructures (N= 6), in both quantitative and qualitative terms. Examples include:

1. Number of laboratory facilities satisfy standards for verifiable research in # fields (Danida BSU).
2. Number of researchers who have access to research infrastructures through support from Horizon 2020 (Horizon 2020).
3. Changes in the broader institutional environment at NORHED-supported institute/faculty/department which strengthened the capacity for education and research (Norad, NORHED).

The more advanced approaches also attempt to measure **the outcomes of capacity building**, for instance in the form of subsequent positions held or career advancements. Examples include:

- Number of promoted researchers (gender disaggregated) (Swiss r4d).
- Ratio of graduates that, within 3 years after completion of the scholarship, are employed in a position that contributes to the development of their country or region of origin (in the reporting year), differentiated by gender, nationality and degree (DAAD, BMZ).

Finally, the IDRC's RQ+ framework also includes a research capacity-strengthening component under **its 'key influences' assessment** criteria. The RQ+ framework states that key influences are designed to 'help evaluators, managers, funders, and others to make meaningful and systematic considerations of the enabling or constraining factors of the

²² COHRED's Research Fairness Initiative: <http://rfi.cohred.org>

research' (Ofir *et al.* 2016). The RQ+ research capacity-strengthening indicator is formulated as:

*'The extent to which the research endeavor or project focuses on strengthening research capacities through providing financial and technical support to **enhance capacities to identify and analyze development challenges, and to conceive, conduct, manage, and communicate research** that can address these challenges' (Ofir *et al.* 2016).*

Comparison with the GCRF/Newton Fund

The GCRF and Newton Funds similarly use trainings and qualifications/research positions as proxies for capacity. For example:

- **Total number of students gaining doctoral degrees** from participation in both funds per financial year per DP. Broken down by country (LMIC/non-LMIC) and next destination of the student (country). Types of doctorates would also be ideal (e.g. industrial doctorate, by publication).
- **Instances of partner country institutions provided with capacity building support/training in research and/or translation**, per financial year, by country.

Capacity is tied to a particular focus on interdisciplinarity in the GCRF/Newton Fund, which is understood as a challenge-oriented capability. The current list does not include qualitative capacity indicators, however, and does not have much KPI focus on research infrastructures in LMICs. These differences are likely to reflect differences in programme/fund focus, as the GCRF and Newton Funds do not generally have large LMIC capacity building components – although specific Delivery Partners do support capacity strengthening to varying extents.

4.2.3 Research communication and dissemination

In most R4D programmes, particularly those that intend to use research to influence change in policy or practice, research dissemination and communication is considered to be a key part of the research-into-use change pathway. In many (N=8) of the funds, indicators that measure the **number of events, and extent of participation at events**, were used to capture the level of communication and dissemination. For example:

1. Number of participants at knowledge sharing events organised by the programme, by type of stakeholder and sex (ACP–EU).
2. Number of conferences and events (World Bank, KCP).
3. Number of science and impact knowledge exchange events organised by the Directorate, or through work commissioned by the Directorate, and their proceedings and outcomes (ESPA, DFID).

Communication and dissemination was also commonly (N=4) reflected in indicators that aim to capture how, and the extent to which, research is being **engaged with in external and user contexts**. For example:

1. Number of unique visitors on the main IGC website (IGC, DFID).

2. Number, source and target of ESPA website hits, twitter followers and ESPA blog hits (ESPA, DFID).
3. Interactions with actual and potential ESPA research users and policy-makers (ESPA, DFID).

An example of good practice is reflected in the RQ+ Framework's formulation of '**positioning for use**', within which communication and dissemination is a key component. The RQ+ Framework defines positioning for use as:

*'the extent to which the research process has been managed, and research products/ outputs prepared in such a way that the probability of use, influence and impact is enhanced. The uptake of research is inherently a political process. Preparing for it therefore requires attention to user contexts, **accessibility of products, and 'fit for purpose' engagement and dissemination strategies**. It also requires careful consideration of relationships to establish before and/or during the research process, and the **best platforms for making research outputs available to given targeted audiences and users**. Positioning for use calls for strategies to integrate potential users into the research process itself wherever this is feasible and desirable. Subdimensions include knowledge accessibility and sharing, actionability, and timeliness' (Ofir et al. 2016).*

Quantitative indicators, including altmetrics, can be a good measure of the extent of engagement with disseminated ideas and products. A qualitative assessment using the RQ+ framework, however, would place and assess communication and dissemination strategies within a broader context of positioning for use. This would enable R4D programmes to assess, track or measure the relationship between dissemination and uptake, for instance.

Comparison with the GCRF/Newton Fund

In the current list there is one GCRF/Newton indicator that measures communication and dissemination:

- **Number of workshop/symposium programmes** and corresponding grants funded under both funds, number of attendees and types of attendees reached from those grants per financial year per DP. Broken down by type (research-user, researcher, industry, government) and country.

This may be sufficient, but it is likely that further assessment of the research into-use process would need to be carried out at the evaluation stage, for instance using an adapted version of the RQ+ Framework (Annex A). Adding further 'positioning for use' dimensions will be necessary at this stage.

4.2.4 Interdisciplinarity²³

Interdisciplinary practice, as a proxy for challenge-oriented research capability, is an important priority for the GCRF. The focus on interdisciplinarity points towards the importance of a systems lens in R4D programmes, which recognises that global development challenges are

²³ UKRI definition: 'the term interdisciplinary is used to refer to the full spectrum of interdisciplinary activity including cross-disciplinary, multi-disciplinary, interdisciplinary and transdisciplinary work' at: <https://re.ukri.org/research/interdisciplinary-research/>

often complex, requiring collaboration and interactions across disciplines, sectors and geographies. These indicators aim to support the measurement of researcher collaboration across disciplines and sectors, underpinned by the understanding that addressing complex development challenges requires this kind of interdisciplinary practice. Only three of the funds reviewed had explicit **indicators for interdisciplinarity**. These were:

1. Directorate reports on its interactions to facilitate inter-/multi-disciplinary collaboration in the ESPA research community. *Measured: Annually (ESPA, DFID).*
2. Marie Skłodowska-Curie actions²⁴ – cross-sector and cross-country circulation of researchers, including PhD candidates (Horizon 2020).
3. Extent to which competence level of inter- and trans-disciplinary research is enhanced (Swiss r4d).

Comparison with the GCRF/Newton Fund

Much like the other funds, the GCRF and Newton Funds have also attempted to measure interdisciplinarity via the quality of research outputs or qualifications. The following indicators are all mapped onto the 'Improved capability to do cross-sectoral interdisciplinary work' in the GCRF theory of change:

- **Total number of students gaining doctoral degrees** from participation in both funds per financial year per DP. Broken down by country (LMIC/non-LMIC) and next destination of the student (country). Types of doctorates would also be ideal (e.g. industrial doctorate, by publication).
- **Number of co-authored research publications addressing local development needs** and challenges flowing from the Newton Fund, per financial year, by country.
- **The interdisciplinarity of both funds' research outputs** by categorical analysis of lists of cited references for articles published per financial year per DP.

Interdisciplinarity is similarly understood as a capability or capacity, which can be reflected in research qualifications, outputs or products. The overall approach is therefore highly comparable.

4.2.5 Influence on policy and practice

Over two-thirds of the funds under review included indicators that attempted to measure influence on policy and practice. The most common approach taken (N=8) was to count the **number of instances of policy influence or number of policy-related outputs**. For example:

1. Number of policies, legal instruments, investments and similar modified in their design or implementation in 2017, informed by CGIAR research (CGIAR).

²⁴ The Horizon 2020 website states that 'The Marie Skłodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers – be they doctoral candidates or highly experienced researchers – and encourage transnational, intersectoral and interdisciplinary mobility', at: <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions> (accessed 8 October 2019).

2. Number of occurrences of tangible specific impacts on European policies resulting from technical and scientific support provided by the Joint Research Centre (Horizon 2020, EU).
3. Number of changes to growth related policies (based on IGC research and advice). Indicated by number of impact cases (IGC, DFID).

Other funds used or included **qualitative approaches**, which appear to point towards impact or outcome case studies:

1. Evidence that relevant, use-inspired, systemic knowledge about trade-offs and options for tackling and solving problems feeds into policy debates and is shared with stakeholders who apply it (Swiss r4d).
2. Uptake/influence of NORHED-supported research in public policies (NORHED, Norad).
3. Credible growth policies and programmes implemented in developing countries (IGC, DFID).

Because of the challenges associated with measuring these kinds of higher-level outcomes in R4D programmes (discussed in Section 3 above), it is likely that the best approaches to KPIs in this area will combine counting the number of cases/instances with qualitative case studies that explore causal mechanisms. This should be **complemented with process indicators** that reflect IDRC's RQ+ 'positioning for use' quality dimension. An example of good practice in this regard is the International Growth Centre (IGC) (Example 8, Annex A), which combines all three approaches. An example of an IGC impact case study can be seen in Box 2.

Comparison with the GCRF/Newton Fund

The GCRF and Newton Fund indicators in current form take a very similar approach to measuring policy influence and practice, embodying the first two methods exemplified above. However, they do not appear to have as many process indicators that connect to research outputs to policy influence via a change pathway that includes, for example, communication and dissemination.

Box 2. Example of International Growth Centre (IGC) Impact on policy

Background: IGC research focused on the role of knowledge and information in supporting technology uptake by farmers. A study in Uganda examined the problem of low-quality fertilisers and seeds – a major barrier to the uptake of these technologies, and a study in Pakistan tested an innovative approach to sharing information on veterinary services with livestock farmers.

Policy impact: In Uganda, the government responded to IGC's evidence on agricultural inputs by introducing a mobile e-verification programme led by the National Bureau of Standards to help farmers distinguish fake inputs from real ones, and endorsed plans to put quality seals on inputs to reduce counterfeits supplied to farmers. The government cited the study and its response to the findings in the Background Paper to the FY 2017–18 National Budget. Concerns raised by the study have also led donors to respond: DFID Uganda supported the inclusion of an indicator on the quality of agricultural inputs in the priority areas under the National Partnership Framework for the high-level policy dialogue between donors and the government. Mobile applications such as the one tested in Pakistan show promise in reducing the informational barriers to agricultural technology adoption. With many different products and business models under development, and research findings on the impacts beginning to emerge, they may prove to be effective solutions in Africa and elsewhere.

Source: 'Knowledge is Power: the Role of Information in Agricultural Technology Adoption, IGC Impact Case Study, at: <https://www.theigc.org/impact/knowledge-power-role-information-agricultural-technology-adoption/>

4.2.6 Innovation outcomes and environments

Roughly one-third of the funds reviewed included indicators for innovation outcomes and environments. Much like policy influence, the most common approach taken (N=5) involved **counting the number of innovations**, for example indicated through patents, as a result of programme activities. Examples of this type of indicator include:

1. Number of CGIAR innovations (CGIAR).
2. Patent applications and patents awarded in the area of the different Societal Challenges (Horizon 2020, EU).
3. Number of prototypes and testing activities (Horizon 2020, EU).
4. Number of high-impact innovations in the portfolio (US Global Development Lab, USAID).

Other approaches attempt to measure **changes at the higher or systemic level**, for example through a combination of global innovation indices (e.g. World Economic forum (WEF) Global Competitiveness Index), alongside standard country level statistics, e.g. number of researchers. Most of the funds addressing innovation, however, did not include KPIs at this level. This is likely to be an indication of challenges of attribution, and the time frames required for impact at this level, discussed in Section 3. The ACP–EU programme's indicative results matrix had a number in this category (exampled below). However, as this programme had not begun implementation at the time of this report, the indicators should not be treated as a definitive list of KPIs that will be operationalised.

1. Gross domestic expenditure on research and development (R&D) (% Gross Domestic Product (GDP)).
2. Innovation environment: Global Competitiveness Index.
3. Technological readiness: Global Competitiveness Index.
4. Employment in knowledge-intensive services (% of workforce).
5. Number of ACP countries reporting progress in research and innovation (R&I) policies/strategies.

An example of good practice is reflected in CGIAR results framework, which **disaggregates innovation according to the stage it has reached**, from research to uptake. This demonstrates an understanding of the iterative nature of innovation processes, and adds nuance to the definition of 'innovation'. CGIAR's framework also distinguishes between 'novel' and 'adaptive' innovations. The latter are adaptations of previous innovations for new areas or situations (CGIAR 2018). Figure 5 shows how CGIAR operationalised its innovation indicators in its 2017 Annual Impact Report (CGIAR 2018).

Figure 5. CGIAR Innovation Reporting: Example Annual Report 2017

STAGE OF INNOVATION	METHODS AND TOOLS	PRODUCTION SYSTEMS	GENETIC	SOCIAL SCIENCE	BIOPHYSICAL RESEARCH	TOTAL
1-Research/proof of concept	50	13	57	6	8	134
2-Piloting	45	9	6	3	3	66
3-Available for use	68	32	228	11	9	348
4-Taken up by 'next users'	38	10	11	7	2	68
Total	201	64	302	27	22	616

Source: CRP annual reports and evidence presented to support claims. A list of innovations available for use in 2017 is in Annex Table C, and a full database is available in [CGIAR Innovations in 2017](#).

Comparison with the GCRF/Newton Fund

Due to the challenges associated with attribution in the use of higher-level innovation impact, for example 'gross domestic expenditure of R&D', the GCRF and Newton Funds have not included this type of indicator. They have chosen to use impact case studies that can more robustly connect the funds' activities with innovation outcomes. They have combined this with counting the number of innovations and, in this respect, their approach aligns with most of the funds reviewed for this indicator type. Examples from the GCRF/Newton Fund indicators include:

- **Instances and case studies where innovations and practical solutions** arising from Newton Fund support have been developed, tested and /or used, per financial year, by country.
- **Instances or case studies demonstrating innovative approach to local problems** (including discipline and scope), per financial year, by country.

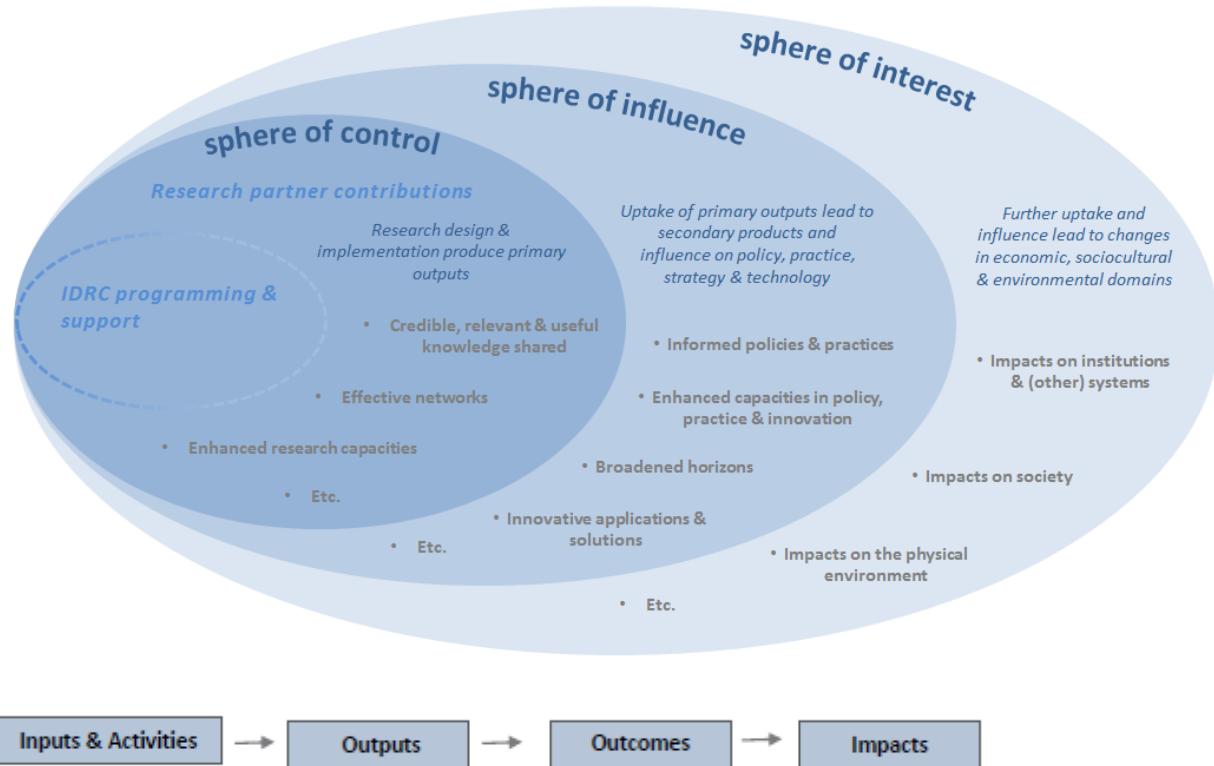
Going forward, the GCRF and Newton Fund might consider an approach further aligned with that of CGIAR's, where 'innovation' is clearly disaggregated by the stage it has reached, and distinguishing between 'novel' and 'adaptive' innovations.

4.2.7 Poverty alleviation and other development impacts in LMICs

For the most part, KPIs were not included for outcomes or impacts at this level, which most likely reflects the challenges connected to measuring impact in R4D programmes, discussed in Section 3. Two exceptions were CGIAR and the International Growth Centre (IGC). The IGC includes an impact indicator for ‘Number of countries identified in the 2011 DFID Bilateral Aid Review with real GDP growth rates of 5% or above’, reflecting its focus on economic growth in LMICs.

The CGIAR is an example of good practice in this area of R4D KPIs (Example 3, Annex A). Recognising various **degrees of influence and control in the R4D change pathway**, it uses ‘aspirational targets’ at the level of impact, which it maps on to the SDGs. It uses the IDRC’s RQ+ framework to map indicators against various degrees of influence and control. The IDRC views the technical quality of research as within the direct control of a research funder and its research partners. The uptake, use, influence and impact of research, however, move beyond the spheres of direct control. Any outcomes in these stages of the R4D change pathway are likely to result from the interaction of multiple actors, agencies, and socio-political circumstances (IDRC 2018a). The IDRC’s framework is presented in Figure 6.

Figure 6. IDRC spheres of control, influence and interest



Source: IDRC, Towards Research Excellence for Development: The RQ+ Assessment Instrument.

Establishing impact in CGIAR

The RQ+ IDRC framework holds its research partners accountable for ‘what they can reasonably and realistically control’ (IDRC 2018a). In establishing performance in the spheres of indirect influence, the IDRC holds its research partners accountable ‘for taking steps to increase the likelihood that the research will be used’: positioning the research findings for

influence and impact (*Ibid*). This means that the indicator focus in IDRC's standard 5-year programmes is on outputs and outcomes, with higher-level change being left to impact assessments that capture and evaluate longer-term results.

The CGIAR has followed the IDRC framework and taken a similar approach, using the evaluation stage to assess the cumulative impact of the CGIAR research and innovations on the higher level of 'aspirational targets'. CGIAR's **results framework includes 10 aspirational targets** that feed into the United Nations SDGs. Some of the targets include:

1. 100 million more farm households to have adopted improved varieties, breeds or trees, and/or improved management practices.
2. 30 million people, of which 50% are women, assisted to exit poverty.
3. Improve the rate of yield increase for major food staples from current <1% to 1.2–1.5%/year.
4. 30 million more people, of which 50% are women, meeting minimum dietary energy requirements.
5. 150 million more people, of which 50% are women, without deficiencies of one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate, and vitamin B12.

CGIAR's full adoption on the 'research for development' framework is reflected in requirements that its projects are linked to 'clearly hypothesized impact pathways to solving specific, long-term development challenges'. To measure impact, it conducts *ex post* impact studies, which use 'rigorous quantitative evidence'²⁵ on the long-term, at-scale impact of relevant CGIAR innovations against each of its aspirational targets (CGIAR 2018).

In CGIAR's results framework, aspirational targets are linked to relevant SDGs, against which evidence on global progress in each area is summarised. The framework then provides evidence on the contribution of CGIAR to each target, based on available adoption and *ex post* impact studies. An example snapshot of the CGIAR aspirational target framework from its 2017 Impact Report is presented in Figure 7.

²⁵ Much of CGIAR's 2017 impact data comes from earlier investments in impact studies through the Strengthening Impact Assessment in the CGIAR System special initiative project (SIAC), which finished in 2017, see: <https://ispc.cgiar.org/publications/documenting-impact-widely-adopted-cgiar-research-innovations> (accessed 29 October 2019).

Figure 7. Snapshot of CGIAR results framework – aspirational targets

SRF ASPIRATIONAL TARGET	LINKS TO SDGS	LATEST DATA AVAILABLE ON GLOBAL PROGRESS	RECENT EVIDENCE ON CGIAR CONTRIBUTION TO GLOBAL PROGRESS
1.230 million people, of which 50% are women, assisted to exit poverty	     	Globally on track World Bank data show that the poverty headcount (including those living on less than US\$ 1.90 a day) has dropped significantly from 1.73 billion people in 1999 to 783 million in 2013. The average international poverty gap has also dropped from 9.6% in 1999 to 3.3% in 2013. ¹⁷ Although gender-disaggregated data are not yet available via the SDGs, are reported to represent about half (50.3%) of the world's extreme poor. ¹⁸ Recent statistics show that 80% of the extreme poor live in rural settings. ¹⁹	New evidence on adoption and impact: Around 9.6 million households adopted improved rice varieties (including NERICA) in Africa between 2000 and 2014. The rate of adoption of these varieties increased over these years and was more significant after the 2008 food crisis. Average income from rice more than doubled for NERICA adopters, from US\$ 25 per capita to US\$ 58 per capita. An estimated 8 million people were lifted out of poverty. ²⁰ (Reported by RICE)

Source: CGIAR Annual Performance Report 2017

Like the IDRC and other centres, for example the International Growth Centre (IGC), CGIAR benefits from long-term engagement in specific sectors and geographies. Unlike the GCRF and Newton Fund, they are able to leverage cumulative impact over time in demonstrating their role in higher-level development outcomes in LMICs. CGIAR, in operation since 1971, notes that the timeline between initiating agricultural research and ultimate impact at scale is typically 5–25 years (CGIAR 2018). As a result, much of the evidence that it uses to show impact relies on earlier research and their projects tend to build on earlier work. Examples of **high-level impact** of CGIAR varieties, technologies and other innovations reported in 2017 include:

1. Approximately **9.6 million households** adopted improved rice varieties in Africa. An estimated 8 million persons were lifted above the poverty line. The New Rice for Africa (NERICA) rice varieties often benefited women more than men.
2. Nearly **67,000 farmers** across four countries in Africa used Aflasafe®, a biocontrol product, to reduce aflatoxin contamination of maize and groundnuts. Aflatoxins are produced by moulds that widely contaminate foods and feeds and are one of many ‘silent’ threats in Africa, affecting health, income and livelihoods.
3. The total estimated number of farming households benefiting from biofortified crops globally now stands at **10 million**.
4. In Nigeria, about a quarter (24%) of sampled farmers adopted drought-tolerant maize varieties. An estimated **2.1 million individuals** were lifted above the poverty line. Adoption on average reduced by 80% the level of downside risk of crop failure, which is critical for food insecure smallholders. A separate nationwide study found that two-thirds of Nigerian farmers adopted improved cassava varieties, and estimated that this led **1.8 million people to escape poverty** in 2015/16 (CGIAR 2018).

Comparison with GCRF/Newton Fund

A challenge facing the GCRF and Newton Fund indicators is the diversity of themes that they address. This means that developing even ‘aspirational targets’ mapped on to the SDGs would be complicated at the level of impact in LMICs. The CGIAR is sector focused on agricultural research and innovation. It also benefits from its role in cumulative knowledge production and influence, because it is not a programme restricted by a project time frame. While the GCRF theory of change has an element addressing impact on the lives of poor people in LMICs, the current list of KPIs does not include measurements for this level.

As the GCRF’s strategic focus on specific themes and development challenges becomes more clarified, for example under the six ‘challenge areas’,²⁶ it might consider adopting a similar approach to CGIAR’s aspirational targets. However, the CGIAR is not a time-bound research fund like the GCRF and Newton Fund. As a result, the latter’s impact at this level would be limited compared to initiatives that have been able to cumulatively engage in specific sectors or geographies over time.

²⁶ GCRF Challenge Areas: Global Health, Food Systems, Resilience, Education, Sustainable Cities, Conflict.

5 Conclusion

To conclude, this study reviewed the key performance indicator (KPI) practice of international research funds, of which 14 were identified as comparable to GCRF and the Newton Fund. With the exception of the EU's Horizon 2020, all of the funds were at least partially funded by official development assistance (ODA) for development impact in LMICs. Rather than looking at the more straightforward input/output indicators, the review focused on areas of measurement that are more challenging, and those that the conceptual literature showed were important for the success of research for development (R4D) change pathways.

5.1 Summary of R4D KPI practice

The most commonly occurring indicators were those for **collaboration and partnerships**, which overlapped with indicators used to measure interdisciplinarity. This reflects recognition that complex global development challenges require collaboration and interactions across disciplines, sectors and geographies. The second most commonly occurring indicators in the funds reviewed were those designed to support the measurement of **research capacity building**. For the most part, these indicators focused on capacity building in LMICs, including individual and institutional capabilities. A number of the funds also included indicators for the **research-into-use process**: most notably indicators used to measure or track communication and dissemination processes. As a rapid review of the conceptual literature indicated, partnership and collaboration indicators are also pertinent for the research-into-use process. This is because the success of R4D change pathways is often dependent on the quality of relationships between researchers, intended users of the research and their specific contexts.

Finally, a number of funds also aimed to track or demonstrate **performance towards higher-level outcomes** and, to a lesser extent, social and economic impacts in LMICs. At the outcome level, for the most part, this involved counting the number of outcomes (e.g. policy influence or innovations). At the impact level, in the case of CGIAR, this was supported by more rigorous *ex post* impact assessments to show the relationship between research and higher-level change in LMICs, which was mapped on to specific SDGs. CGIAR names these higher-level goals 'aspirational targets', which fall into the sphere of a programme's indirect influence.

Each impact pathway in an R4D programme is likely to be highly context dependent, non-linear and take considerably longer than the time frame of an average 5-year development programme. Impact on social and economic development outcomes in LMICs is therefore likely to come about through a cumulative process of knowledge production and influence over time. It is also likely to result from the actions of various actors and interventions. As a result, developing KPIs for R4D programmes is best supported by an awareness of various degrees of influence and control, as shown in the case of CGIAR. This allows R4D programmes to measure the extent to which research has been 'positioned for use', while leaving the assessment of its actual impact to *ex post* evaluations. The IDRC RQ+ framework reflects good practice in this regard.

Comparison of GCRF/Newton Fund to its peers

On the whole, this review of donor practice in R4D funds points towards a high degree of alignment with the KPI approaches undertaken by GCRF/Newton Fund across all of the seven indicator types. Where differences do occur, they tend to reflect differences in programme theories of change: for instance, the GCRF and Newton Fund have a lesser focus on institutional capacity building in LMICs than a number of the funds reviewed here.

In summary, the main differences with its peers across the seven indicator types are:

- **Partnerships and collaboration.** The focus of GCRF /Newton Fund is on the number of new or continuing partnerships, and co-production of inputs or outputs. The main difference with comparable funds is that despite the emphasis on equitable partnerships, there are no indicators for measuring the quality of research partnerships – particularly the higher benchmark of ‘research legitimacy’ that considers unequal power relations (IDRC RQ+, the Swiss r4d programme).
- **Capacity building.** The GCRF and Newton Funds similarly use trainings and qualifications/research positions as proxies for capacity – tying it to a particular focus on interdisciplinarity. The main difference is that the current list does not include qualitative capacity indicators, and none on research infrastructures in LMICs – although these differences reflect the different focus of the GCRF and Newton Fund.
- **Research communication and dissemination.** Only one indicator for GCRF/Newton Fund measures communication and dissemination. A key difference with other funds is the lack of capture of ‘positioning for use’ (RQ+), although this may be best captured through an evaluation stage.
- **Interdisciplinarity.** The overall approach of GCRF and the Newton Fund is highly comparable to other funds; which attempt to measure interdisciplinarity via the quality of research outputs or qualifications.
- **Influence on policy and practice.** The GCRF and Newton Fund indicators take a very similar approach to comparable funds in measuring policy influence and practice: a count of the number of instances of policy influence or number of policy-related outputs; complemented with qualitative approaches to capture impact/outcome – based case studies. The main difference is the absence of process indicators that connect research outputs to policy influence via a change pathway that includes, for example, communication and dissemination.
- **Innovation outcomes and environment.** Due to the challenges associated with attribution to higher-levels of innovation impact, the GCRF and Newton Funds (like the majority of comparable funds) have not included this type of indicator. The main exceptions are funds that attempt to measure changes at the higher or systemic level (ACP–EU programme); and, those that disaggregate innovation according to the stage it has reached, from research to uptake (CGIAR).
- **Poverty alleviation and other development impacts.** Similarly, the majority of comparable funds – like GCRF and Newton Fund – do not assess poverty or other more systemic development impacts through KPIs. The diversity of themes covered by GCRF and Newton Fund means that developing even ‘aspirational targets’ mapped onto the SDGs is complicated at the level of impact in specific LMICs.

5.2 Suggested ways forward

KPIs, being part of a monitoring system, will only ever provide a partial view of the performance and impact of the GCRF and Newton Fund – and need to be complemented by other types of evidence provided by evaluations and research studies. Nevertheless, the approaches taken by the IGC and CGIAR are worthy of further consideration. It is worth noting that in both cases, these research centres benefit from long-term engagement in specific sectors and/or geographies. As a result, they are in a better position to demonstrate cumulative pro-poor impacts. In future, as the GCRF and Newton Funds develop more fine-tuned strategic focus in specific thematic areas, for example around the six GCRF ‘challenge areas’, they may consider using something like the CGIAR model. Any adoption of such an approach, however, would have to be underpinned by recognition of the GCRF and Newton Fund’s more limited contribution to impact as a result of their shorter time frames. CGIAR, for instance, has been in operation since 1971 and the IGC since 2008.

It is also suggested that going forward, the GCRF and Newton Fund consider the adaptation of the IDRC’s RQ+ framework to ensure that its KPIs better capture key **‘positioning for use’ dimensions**, including process indicators that track communication and dissemination strategies, as well as the quality of research partnerships, relationships with research users, and understanding of user contexts. From the review of the literature, the emphasis of KPIs is often on the quality and equity of processes to deliver development impact, rather than impact indicators per se.

In sum, this review suggests the next phase in BEIS’s ongoing efforts to strengthen the GCRF and Newton Fund accountability, learning and reporting systems might:

- Consider using the IDRC RQ+ framework to ensure that positioning for use dimensions are captured in the current GCRF/Newton KPI list.
- As the strategic focus of both funds develops, consider the adoption of aspirational targets like CGIAR’s, which can be mapped onto the SDGs.
- Consider more firmly disaggregating innovation indicators so that they reflect ‘stages of innovation’, from research to uptake. This approach has also been adopted by the CGIAR.

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