



Oxford's Global
Innovation Consultancy

Analysis to co-design a research and innovation programme

Final Report

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Executive summary

The UK Foreign, Commonwealth and Development Office (FCDO) manages the majority of the UK's official development assistance each year and uses it to fund projects and programmes in low and lower middle-income countries to drive poverty reduction. R&D programming is a crucial element in expanding the evidence base for what works in support of development outcomes.

FCDO has commissioned Oxford Policy Management (OPM) and Oxentia to produce an evidence base and suggest key design features for a new programme to strengthen Research & Innovation Systems in middle and lower-income countries. This Evidence Synthesis and Recommendations Report is based on an extensive literature review, more than 16 extensive key informant interviews, and benchmarking on international funders and relevant programmes.

For the purpose of this project, we have defined the Research and Innovation (R&I) system as follows (adapted from the World Economic Forum):

A research and innovation system is a set of interrelated institutions and individuals that identify and generate solutions to problems and apply these to achieve wider societal impact. These applications can include the design and commercialisation of products, the introduction of new processes, institutions and systems, or the development and implementation of public policy.

R&I system capacity strengthening has substantial potential to deliver long-term sustainable benefits to Low- and Lower-Middle-Income. Strengthening countries' capacity to coordinate and deliver research, and generate and scale innovations will support them to develop local solutions to social, economic and environmental challenges, generating sustainable prosperity and improved health and well-being.

However, R&I systems are complex, involving many individuals and organisations across government, the private sector and civil society. Outcomes result from the interdependence of components in these systems; isolated interventions which support individual components risk being ineffective or unsustainable if related components of the system remain weak. For example, training individual researchers to obtain PhDs may be ineffective if those researchers are not able subsequently to secure stable employment in institutions which enable them to pursue active research careers.

Research systems, innovation systems and the interface between them is highly variable across countries. There can be strong research systems and innovation systems which are disconnected with virtually no support – or there can be strong support for innovation and very little for research. Sometimes there will be a facilitated relationship bridging research and innovation but often not. Conditions are very country specific so 'one-size' international interventions won't have the same utility and impact in every country. Many Asian countries support innovation more than many African countries but not necessarily in a way which is linked to research.

Strengthening R&I systems therefore requires a long-term, holistic, strategic perspective which engages with multiple components of a system simultaneously and can be tailored to country conditions. The scale of the challenge is such that no one international funder or donor agency is likely to be able to bring about sustainable transformation on their own. Especially not by applying the same assistance in every

country. The long-term sustainability of R&I systems also requires engagement with local and national governments, which must at some stage assume ownership and full responsibility for sustaining and strengthening their national systems.

Fortunately, the UK’s Foreign, Commonwealth and Development Office (FCDO) is particularly well-positioned, arguably uniquely so, to provide the international leadership and coordination to invest in R&I system strengthening, and also to nuance efforts in different countries. Through this, FCDO could accelerate a virtuous cycle in which strengthened R&I systems increasingly produce tangible outcomes, encouraging further investment and increased prioritisation of those systems from other investors and LMIC national governments.

This report provides a high-level sketch of how a new FCDO programme could progress this agenda. It recommends a three-pronged strategic approach which targets the following areas:

1. Coordination and alignment among international funding agencies to support R&I systems;
2. Strengthening the capacity of relevant stakeholders to develop and implement national Science, Technology and Innovation (ST&I) strategies and policies;
3. Supporting the capacities of individual organisational components of the R&I system (including universities, academies of science and other learned societies, think tanks and knowledge intermediaries), particularly to function as ‘boundary organisations’ which strengthen the connections between various system components.

The first of these pathways to impact is about FCDO working at the global level with international organisations – ultimately resulting in impact at the country level. Pathways 2 and 3 are about FCDO’s direct implementation in each focus country (specific focus countries are yet to be defined). Throughout the Evidence Report, there is a strong emphasis placed on the finding that each country’s R&I system is different. This is why mapping is so important. And this is why, whilst the country-level outcomes are the same for each country, the detail of activities and outputs and the precise type of impact FCDO should have will respond to local conditions and be different in each country.

This approach reflects both areas which are currently neglected and the strengths of the FCDO as a development agent. Interventions at these three levels can be complementary and mutually reinforcing. For example, improved donor coordination will make it easier to implement coherent ST&I strategies, as will strengthening individual organisations within the system. Strengthened national ST&I strategies will make it easier to identify which organisations within a system should be prioritised for support, and provide a clear framework for assessing the effectiveness of donor activities in supporting overall system strengthening.

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List of abbreviations

3IE	International Initiative for Impact Evaluation
ACBI	Africa Capacity Building Initiative
ACTS	African Centre for Technology Studies
APASTI	ASEAN Plan of Action on Science, Technology and Innovation
ASEAN	Association of Southeast Asian Nations
AU	African Union
ATIP	Africa Technology and Innovation Partnerships
BCURE	Building Capacity to Use Research Evidence
BMGF	Bill & Melinda Gates Foundation
CCNY	Carnegie Corporation of New York
EIDM	Evidence-informed Decision-making
FCDO	Foreign, Commonwealth and Development Office
GCRF	Global Challenges Research Fund
GFBR	Global Forum on Bioethics in Research
GPEKE	Global Platforms for Equitable Knowledge Ecosystems
GRP	Global Research Partnerships
HIC	High income country
HSR	Health Sciences Research
IDIA	International Development Innovation Alliance
IDRC	International Development Research Centre
LMIC	Low- and middle-income country
NIHR	National Institute of Health Research
OPM	Oxford Policy Management
PRFS	Performance-based Research Funding System
RCB	Research Capacity Building
RCS	Research Capacity Strengthening

RISA	Research and Innovation Systems for Africa
RFO	Research Funding Organisation
RRC	Rethinking Research Collaborative
R&I	Research and Innovation
SCGI	Science Granting Councils Initiative
SEDI	Strengthening Evidence Use for Development
SIDA	Swedish International Development Cooperation Agency
SRIA	Strengthening Research Institutions in Africa
STISA 2024	Science, Technology and Innovation Strategy for Africa 2024
ST&I	Science, Technology & Innovation
WEF	World Economic Forum
WHO	World Health Organisation
WHO/TDR	World Health Organisation Special Programme for Research and Training in Tropical Diseases

1 Introduction

The UK's Foreign, Commonwealth and Development Office (FCDO) aims to launch a new programme in January 2026 to strengthen research and innovation (R&I) systems for development and diplomatic impact in Africa, India and Southeast Asia. This programme (henceforth: the successor programme) will follow existing programmes which are scheduled to conclude in December 2025. These are:

- Strengthening Research Institutions in Africa (SRIA)
- Africa Technology and Innovation Partnerships (ATIP)
- Strengthening Africa's Science Granting Councils, Phase II (SGCI2)
- Research and Innovation Systems for Africa (RISA)¹

Other previous FCDO programmes may also have produced valuable lessons to inform the successor programme. These include:

- Africa Capacity Building Initiative (ACBI)
- Global Research Partnerships (GRP)
- Building Capacity to Use Research Evidence (BCURE)
- Strengthening Evidence Use for Development Impact (SEDI)

Additionally, several other international organisations have an interest, and in many cases have made substantial investments, in R&I systems strengthening. These include multinational organisations such as the OECD, other national funders (notably the International Development Research Centre (IDRC), Norwegian Agency for Development Cooperation (Norad) and the Swedish International Development Cooperation Agency (SIDA)) and private philanthropic organisations (Wellcome Trust, Carnegie Corporation of New York, Rockefeller Foundation, Bill and Melinda Gates Foundation).

The purpose of this report is to consolidate existing evidence, learning and conceptual thinking on how international actors can most effectively support the strengthening of R&I systems in Low- and Middle- Income Countries (Lower income countries) to deliver development impacts. When combined with an understanding of FCDO's particular strengths, and an analysis of the gaps in support by the international community as a whole, this provides clear direction for the design of interventions and core principles which should shape the successor programme.

1.1 Research and Innovation: One system or two (maybe even three)?

One of the first conceptual questions in considering the design of a programme to succeed those listed above is whether, and how, to combine interventions directed at research systems or innovation systems. While the terms are often referenced together, there are also very separate sets of literature and conceptual frameworks related to each. In brief, the

¹ The RISA Fund is a mechanism that supports projects delivered as part of both the ATIP and SRIA programmes

literature on research systems tends to focus on the activities of universities or similar, often publicly funded, research organisations (such as national laboratories or think tanks), though the fact that research activities can also occur within private sector companies is recognised. On the other hand, literature on innovation systems tends to focus on the private sector, often with an emphasis on the role of entrepreneurs, start-ups, and investors, though recognising that university research may often have an important contribution to make.

To this can be added a third, related concept of ‘evidence use’, ‘evidence-informed policy-making’ or ‘Evidence-informed decision-making (EIDM)’, which was the focus of the BCURE and SEDI programmes noted above. This centres around using the results of research and/or evaluation to influence the design and implementation of public policies and services. EIDM can also be targeted towards non-governmental organisations, to support the effective delivery of their missions. Again, EIDM, and discussions of ‘evidence ecosystems’ has a separate body of literature, with research centres and global professional networks (e.g. the International Initiative for Impact Evaluation (3IE)², Africa Centre for Evidence³, Africa Evidence Network⁴). Some definitions of these terms are provided in **Table 1**.

Table 1: Definitions of Research, Innovation and Evidence-informed decision-making (EIDM)

Term	Definition
Research	Research and experimental development (R&D) comprises creative and systematic work undertaken in order to increase the stock of knowledge of humankind, culture and society – and to devise new applications of available knowledge (OECD, 2015).
Innovation	An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process) (OECD, 2018) <i>or</i> Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation, or external relations (OECD, 2005). From a development perspective, an innovation is a new solution with the transformative ability to accelerate impact. Innovation can be fuelled by science and technology, can entail improved ways of working with new and diverse partners, or can involve new social and business models or policy, creative financing mechanisms, or path-breaking improvements in delivering essential services and products. Innovation has been and will be pivotal for reaching sustained, scalable solutions to the world’s most complex problems (IDIA, 2015)
Evidence-informed Decision-making	EIDM entails identifying, appraising, and mobilizing the best available evidence for safe and effective...policy and programmes (WHO 2022)

Our view is that research, innovation and evidence use are related concepts and processes that should be considered holistically. Separations between these domains are largely historical and perpetuating them in LMIC contexts risks creating unhelpful divisions. The

² <https://www.3ieimpact.org/>

³ <https://www.uj.ac.za/faculties/humanities/research/research-centres/africa-centre-for-evidence/>

⁴ <https://www.africaevidencenetwork.org/en/>

common thread among these processes is that they can contribute to a process of novel problem-solving, the conceptualisation of which is illustrated in **Figure 1**. Problems are solved by individuals or groups of agents by drawing on a range of resources. For this activity to be beneficial to wider society, a community of problem-solvers must be fostered, informed of the most important societal challenges for which there may be novel solutions, and then provided with means to apply those solutions to the wider social context.

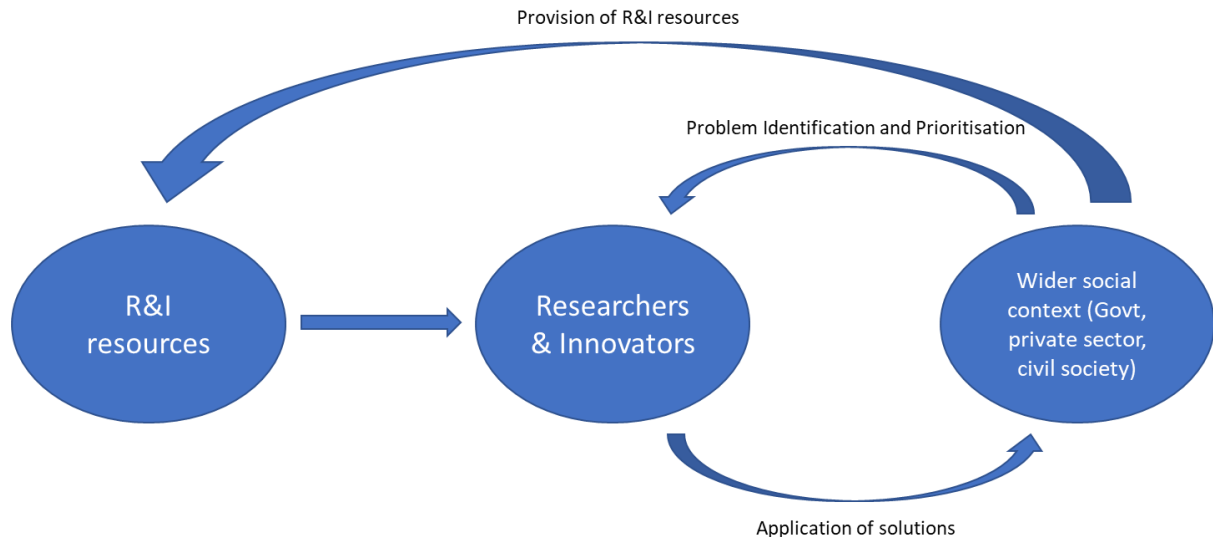


Figure 1: Basic functional model of an R&I system

This formulation builds on a definition of research capacity building provided by Lansang and Dennis (2004):

...building research capacity can be defined as the ongoing process of empowering individuals, institutions, organizations and nations to:

- define and prioritize problems systematically
- develop and scientifically evaluate appropriate solutions and
- share and apply the knowledge generated (ibid., 764-65)

A similar sentiment was expressed in a major World Bank report (2008):

...STI (Science, Technology and Innovation) capacity building is about building the technical, vocational, engineering, entrepreneurial, managerial, and scientific capacity to *solve* each country's pressing social and economic problems, *transform* their societies, and have a positive *impact* on the standards of living and quality of life of the poorest strata of society (Watkins and Ehst, 2008: emphasis in original).

Crucially, however, taking a combined approach to research, innovation and evidence systems emphasises that this problem-solving activity does not only occur within research organisations, but can take place nearly anywhere, in government departments, private companies or civil society organisations. Recognising that R&I related problem identification and solving can occur in a diverse set of contexts can go some way to addressing the post-colonial critique of research capacity strengthening, which notes:

Research capacity discourses are articulated from a deficit perspective that reasserts western hegemony and imposes monolithic blueprints of excellence to the detriment of alternative epistemologies and knowledge production models. Research capacity processes entail not only technical but also normative and political questions...

...‘Capacity for what? Capacity for whom?’ Engaging with these questions requires understanding not just how knowledge contributes to positive social change but also how RCD interventions can define what knowledge is produced in the first place, and who benefits from it (Mormina & Istratii, 2021).

Effective R&I capacity strengthening, therefore, is not just about building the technical expertise and enabling institutions to perform R&I, but includes fostering an environment in which the questions of ‘capacity for what?’ and ‘capacity for whom?’ can be inclusively and productively contested.

1.2 Structure of the report

In light of the above, the objectives of the FCDO’s successor programme should be to contribute to the strengthening of systems through which partner countries can engage in an inclusive discourse of which societal problems should be prioritised, effectively allocate resources and expertise towards their solutions, and deploy those solutions at scale to resolve those problems.

To set out how to achieve this, **the next section** reviews the literature related to two key issues in designing capacity-strengthening interventions. The first is at what level interventions should be targeted: individual, institutional or systemic. The second is whether capacity-strengthening activities should be conducted in isolation or embedded within broader research and innovation activities. It concludes that the successor programme should focus on the systemic level, which includes institutional support focused on strengthening interactions between different system components. Many of these capacity-strengthening interventions can effectively be embedded within broader direct support for research and innovation delivery, but it is necessary to design such programmes carefully so that capacity-strengthening objectives are not de-prioritised. Section 2 covers research and innovation system interventions.

Section 3 is about mapping the R&I System and presents a general conceptual framework of what a functioning R&I system looks like which allows national idiosyncrasies to be analysed. It identifies four key processes, various types of institutions which deliver them, and the interconnections between them.

Section 4 describes backward-looking key informant evidence, that is, the views of key stakeholders on the strengths and weaknesses of the support to R&I Systems to date.

Section 5 describes evidence from Benchmarking Analysis, i.e. inspection of a wide range of past and current support programmes.

Section 6 commences the Theory of Change narrative by setting out the problem statement that identifies three areas which have substantial potential to generate transformative change and in which FCDO is well-suited to intervene. The three strategic challenges identified are:

1. Coordination and alignment among international funding agencies to support R&I systems;
2. Strengthening institutional development and capacity to implement national Science, Technology and Innovation (ST&I) strategies and policies;
3. Building the capacities of individual organisational components of the R&I system (including universities, academies of science and other learned societies, think tanks

and knowledge intermediaries), particularly to function as ‘boundary organisations’ which strengthen the connections between various system components.

Sections 7, 8 and 9 discuss each of these strategic challenges in detail, summarising the evidence supporting the assertions that these areas represent priority challenges, that FCDO is particularly well positioned to address them, and informing how such interventions could be designed.

Section 10 summarises key informant evidence about this report’s recommendations about future R&I System support. It is very focused on stakeholders from ASEAN.

Section 11 concludes the study.

2 General issues in the design of R&I capacity strengthening interventions

In designing an R&I capacity strengthening initiative, two general questions must be considered up front. First, at what level should the intervention be targeted. Second, should capacity strengthening be the sole focus of the intervention, or should they be embedded in more direct R&I activities.

2.1 Levels of intervention in research capacity strengthening

It is generally recognised in the literature that R&I capacity strengthening can occur at three different levels: individual, institutional/organisational and environmental/systemic (see **Table 2**). This framing was articulated in a DFID 'How-to-note' in 2010 and further developed through a UKCDS (now UKCDR) workshop (Vogel, 2012). At that time, most capacity-strengthening interventions in Lower income countries were focused on individual-level training. These documents questioned the assumption that capacity strengthening at one level would generate benefits at other levels (i.e. that support to individual researchers would automatically strengthen the organisations in which they worked) and highlighted a substantial lack of tangible interventions at the systemic level. The idea that individual researcher training will lead to organisational or systems level strengthening also has been contested by several others (e.g. Bowsher, et al. 2019, Marjanovic, et al., 2013, Manabe, et al., 2011, Bates, et al 2011, Franzen et al. 2017).

2.1.1 Individual level

Nevertheless, investment in individual training remains the dominant model to support capacity strengthening. Another UKCDR report (2020) identified 17 fellowship and scholarship schemes operated by UK funders between 2014 and 2019 which included Master's, PhD, postdoctoral and early career support. In total these provided over £190 million in funding to support 5,633 individuals. The majority of these awards were for Master's level training, and it was acknowledged that these may not contribute to RCS, which is often not the strategic focus of such schemes.

Outside of the UK, numerous bilateral donors and philanthropic funders also fund individual fellowships, but systematic data on this is not available (*ibid.*). In one example, the Carnegie Corporation of New York (CCNY) supported 2,144 fellowships in Africa through its NextGen fellowships programme between 2010 and 2019 (Madhani, 2021). In another, since 1999, the World Health Organisation Special Programme for Research and Training in Tropical Diseases (WHO/TDR) has run a Career Development Fellowship programme that places LMIC researchers for one year within a pharmaceutical company to be trained in product development and clinical research (Käser et. al. 2016). The MasterCard Foundation's Scholars programme has supported over 45,000 individuals since 2012, ranging from secondary education through to Master's degrees⁵.

Other programmes provide shorter-term support for the development of individual researcher skills. For example, the AuthorAID network supports over 14,000 researchers in

⁵ [Mastercard Foundation Scholars Program - Mastercard Foundation \(mastercardfdn.org\)](https://www.mastercardfdn.org/)

Lower income countries to publish and communicate their work through mentoring, training workshops, discussion groups and access to best practice resources⁶.

Table 2: Levels of research capacity strengthening (from UKCDR 2022)

Level	Individual	Institutional	Environment
Target Group	Individual research or research teams	Research departments, institutes, think tanks and networks of research organisations	National and international research systems
Description	Career development for junior, mid-career and senior scholars and research support staff	Development of organisational capacity in research funding, management and sustainability	Change in the conditions of the policy and regulatory context and resource base for research
Areas of practical focus	<ul style="list-style-type: none"> • PhD and post-doc training • Scholarships and fellowships • Soft skills development courses • Mentoring • Networking and collaboration 	<ul style="list-style-type: none"> • Research facilities (laboratories, libraries, IT equipment) • Career incentives for research staff • Fundraising schemes • Research management systems • Networks and collaboration 	<ul style="list-style-type: none"> • National legal framework, research strategies and priority setting • Institutional architecture (councils, agencies) • National research budget base and allocation • Policy-demand and public interest in research • Research culture and best practice principles • Research links to government and society
UK-Funded examples	<ul style="list-style-type: none"> • Wellcome - NIHR International Training Fellowships • FCDO - MRC African Research Leader Scheme • Royal Society and African Academy of Sciences: FLAIR Fellowship 	<ul style="list-style-type: none"> • Developing Excellence in Leadership Training and Science (DELTAS) • Research Management Programme in Africa (ReMPro Africa) 	<ul style="list-style-type: none"> • Alliance for Accelerating Excellence in Science in Africa (AESA)⁷ • Science Granting Councils Initiative (SGCI) • Strengthening Research Institutions in Africa (SRIA)

The dominance of individual-level capacity strengthening is likely due to two factors. The first is the aforementioned, and unsubstantiated, assumption that strengthening individual capacity will lead to strengthening at higher levels (it can reasonably be characterised as a necessary, but not sufficient factor in overall system strengthening). The second was articulated by Mormina (2018):

⁶ <https://www.authoraid.info/en/about/>

⁷ The portfolio of research managed by AESA is now managed by the SFA Foundation.

Research investments in Lower income countries aim primarily to the production of research outputs (Enoch 2015), often by high income countries (HIC) teams in collaboration with LMIC researchers. RCB (Research Capacity Building) is often seen as an ethical requirement to level the playing field between collaborators with unequal capacities and resources for research (Parker and Kingori 2016), and thus the focus is strongly on skills development of local scientists. This approach to RCB is popular because it is easier to implement, measure and evaluate, but gives insufficient attention to the wider and long term social factors that help or hinder local knowledge production. Yet, if science is to be harnessed to promote social and economic progress in LMIC, RCB must be viewed as integral to development strategies and approached more holistically at a macro, systems level, not just at a micro, individual level.

This is not to say that the development of individual skills is not an important component of capacity-strengthening. Rather, such training needs to be organised and understood in the wider context of overall organisational and systemic strengthening, instead of driven just by the need to acknowledge imbalances in international project partnerships.

2.1.2 Organisational/Institutional level

Capacity-strengthening interventions at the organisational level have increased significantly over the past decade. In many cases, these have evolved from individual level programmes, with a shift of focus to research organisations to build institutional capacity to provide research training. For example, the Global Platforms for Equitable Knowledge Ecosystems (GPEKE) project was designed to build on AuthorAID to promote gender equity in research institutions in Uganda and Ethiopia, among other objectives (Young et al, 2023). CCNY expanded its NextGen programme to support postgraduate training and postdoctoral research programmes at four African universities: Makerere, University of Cape Town, University of Ghana and University of the Witwatersrand (Madhani, 2021).

Other initiatives seek to support organisational capacity as part of support for thematic research activity. For example, the National Institute of Health Research (NIHR) Global Health Research Centres include a focus on capacity strengthening which expects the funded centre to include:

- strengthening career pathways for researchers, from master's students to senior academics
- developing and retaining a trained and networked global cohort of experts and future research leaders
- supporting the training and development of research managers and other non-academic staff⁸.

One of the most substantial efforts to support research organisation capacity strengthening through project funding is the UK-funded DELTAS Africa programme, which prioritises four strategic areas:

- **Enhanced scientific quality:** DELTAS Africa produces world-class scientific research that addresses African health and research priorities through scientific discourse and collaborative supervision by promoting collaborations with well-resourced universities, research institutions and think-tanks to strengthen capacity

⁸ <https://www.nihr.ac.uk/explore-nihr/funding-programmes/global-health-research-centres.htm>

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- **Strengthened research leadership capacities:** To strengthen scientific research training and build career pathways for scientific researchers, DELTAS Africa focuses on the tertiary and postgraduate training of science students and professionals along a defined career pathway. Training offered by DELTAS Africa Initiatives is designed to provide individuals at all career stages with the academic support and research facilities they need to develop into world-class researchers
 - **Strengthened research systems:** To cultivate professional environments to manage and support scientific research. This recognises that developing and supporting research requires that researchers have access to skilled administrative support and adequate resources to compete at a global level; and that creating supportive, sustainable environments is crucial to developing research capacity
 - **Enhanced scientific citizenship / societal engagement:** Foster mentorship, leadership and equitable collaboration in science, and engagement with public and policy stakeholders. DELTAS Africa recognises that for research to achieve real impact it needs to be communicated to policymakers and the public. Communicating research findings to policymakers will ensure that the findings inform policy. At the same time, public engagement is also key to raising public awareness and interest in science, increasing the uptake of new health policies and treatments, and strengthening relationships with local communities⁹.

In addition to its core consortia funding, DELTAS includes supplementary funding to support learning on effective capacity strengthening through the Learning Research Programme, which has made substantial contributions to the capacity strengthening literature¹⁰. It also funds the Community and Public Engagement Seed Fund, which awarded 25 grants of up to \$35,000 to DELTAS researchers and staff to promote the societal impact of DELTAS research.

Another key aspect of the DELTAS programme is the ‘hub-and-spoke’ model. This reflects the configuration of consortia which include a lead institution with partners in other African countries. The intention of this (as described in an interview) is to promote south-south collaboration and distribute capacity more broadly from the small number of established, and relatively well-resourced African health research organisations. The trade-off is that building capacity in less well-established organisations requires additional time and resources, and a greater appetite for risk than working solely with established organisations.

A key innovation of these institutional level programmes is the recognition that organisations can benefit from resourcing not only to strengthen cohorts of researchers, but management and administrative capabilities, as well as broader skills such as public engagement. Evidence from our interviews suggests that stakeholders are optimistic that this capacity-strengthening will be sustainable and enable institutions to unlock further sources of funding in the future. However, it remains to be seen whether this optimism will be realised once existing programme funding concludes.

2.1.3 Systemic/environmental level

Interventions targeting the functioning of the whole R&I system remain rare. One recent review in health noted that only 19% (n=8) of the interventions it identified included system-level elements (Bowsher, et al. 2019). The majority of these involve engaging with the

⁹ <https://scienceforafrica.foundation/deltas-africa>

¹⁰ <https://www.lstmed.ac.uk/research/centres-and-units/centre-for-capacity-research/deltas-%E2%80%93-learning-research-programme>

political context in relation to HIV or tobacco control, rather than overall systems-level research capacity strengthening.

As illustrated in Table 2, the only identified UK examples of system level capacity strengthening interventions are part of existing FCDO programmes. Some practical focus areas, including ‘policy-demand and public interest in research’ and ‘research links to government and society’ are often incorporated into research projects and programmes as part of efforts to strengthen the impact of research. However, other areas are largely neglected. As will be discussed further below, the only interventions which engage with ‘institutional architecture’ are the Science Granting Councils Initiative (SGCI) and support for the Science For Africa (SFA) Foundation (the successor to the Alliance for Accelerating Excellence in Science in Africa (AESAs)).

This lack of attention is concerning as numerous reports and articles stress that sustainable and equitable long-term capacity strengthening is ultimately dependent on the establishment of national research funding infrastructure and local ownership of research agendas.

2.2 Embedded or stand-alone

Another key framing question for designing a R&I capacity strengthening intervention is whether capacity strengthening should be the sole explicit objective of the intervention or whether this should be embedded in broader research funding initiatives.

Table 3 summarises the analysis done by UKCDR on strengths and weaknesses of embedded or stand-alone investment in research systems. In some cases, stand-alone investment may not be possible due to budget rules which require resources to be spent on Frascati-defined research¹¹ (i.e. CDEL¹²). Given this, Table 3 can be used as a guide to some steps to take to ameliorate the risks of embedded approaches to capacity-strengthening. Specifically:

- Funding rules can emphasise the importance of research capacity-strengthening objectives as equivalent to the delivery of excellent research. Peer review processes can be designed to give equal weight to capacity strengthening objectives.
- Resources can be allocated to capacity strengthening activities, and the importance of management expertise can be emphasized.
- To address risks of siloed capacity, programmes can be designed to emphasize the sharing of knowledge and learning across projects and programmes.

There is evidence of these recommendations being implemented by existing research programmes, such as DELTAS and the NIHR Global Health Research Centres.

¹¹ The Frascati definition of research is a standard established by the OECD to identify the types of activities which should be defined as research for taxation and policy purposes. More information available at: [Frascati Manual 2015 | OECD](#)

¹² Capital Departmental Expenditure Limits (CDEL) refers to UK government allocated funds which can be spent on investment, Resource Departmental Expenditure Limits (RDEL) refers to funds that are spend on day to day resources and administration costs. Frascati-defined research can be classified as CDEL [CBG_2023-24_final.pdf \(publishing.service.gov.uk\)](#). para 6.33 page 101.

Table 3: Strengths and weaknesses of stand-alone vs. embedded RCS (UKCDR, 2022)

RCS model	Strengths	Weaknesses
Stand-alone	<p>RCS becomes an explicit objective of a project with resources focused on achieving RCS outcomes</p> <p>Acknowledges that RCS is a specialist area with recognition of skills needed to achieve impact</p> <p>Builds capacity across research disciplines rather than in one research area, prepares LMIC institutions to pivot to new topics</p>	<p>Hard to mobilise funds for stand-alone RCS without an element of development research outputs</p> <p>Detached from funding streams that support ‘doing’ research</p>
Embedded	<p>Enables capacity to be built through the process of doing research</p> <p>Mobilises more funding for RCS as cuts-across different thematic investments</p>	<p>Can lead to RCS being ‘tagged-on’ to projects and not being a core component, as research topic takes precedence</p> <p>Non-specialists in RCS can end up being charged with delivering and evaluating RCS components</p> <p>Can lead to siloed capacity in one area</p> <p>Activity may be detached from other initiatives and disconnected from wider government development policies and strategies, resulting in poor coordination and unconsolidated impacts.</p>

2.3 Innovation systems

So far, this section has exclusively discussed issues related to interventions in research systems. The literature on innovation systems is not characterised by the same structural model, but subsequent sections, considering specific interventions, will illustrate how these considerations can be applied more broadly to encompass innovation as well.

A different framework for innovation systems has been proposed by the International Development Innovation Alliance (IDIA) (2021), which articulates three different approaches to innovation system strengthening, which exist on a continuum: entrepreneurial, innovation-oriented and mission-driven. They are distinguished by their purpose, target issues, scope and typical interventions (see **Figure 2**). The IDIA report notes that most system strengthening interventions have focused on the entrepreneurial and innovation areas of the continuum.

A key consideration in expanded frameworks constructed around research to incorporate the broader innovation ecosystem is to recognise that innovation systems tend to include a broader and more diverse range of actors than research systems. Within this, though, we

can recognise a similar trend in innovation system support as has been described for research capacity strengthening. That is, historically support has been focused on trying to identify single-point solutions to challenges. This is evolving towards 'ecosystem facilitation models' which are focused on helping different actors in the system connect to define problems and solutions themselves.

Another challenge is that it can be more difficult to define 'success' or 'completion' with innovation. Is it when a company patents a product, launches it on the market, gets its first customer? When it attracts investment? When does it get to IPO? Appropriate measures are likely to be highly dependent on the context in which innovation is supported.

Also, innovation ecosystems are much less structured than research systems. In the early stage innovation ecosystems may resemble research ecosystems and a similar approach to systems strengthening may work: at the early stage, things like government grants/loans, technology transfer expertise, strong networks, and good IP policy are relevant. Beyond a certain point, however, the success of innovation starts to depend on a wider range of influences and factors, including infrastructure, resources, external investment and access to markets, which are difficult to influence.

It is also worth reemphasising that innovation takes place in a much broader range of locations than just universities, meaning that supporting innovations can be more difficult given the very different context and needs of innovations developed at grassroots, SME, corporate and university environments.

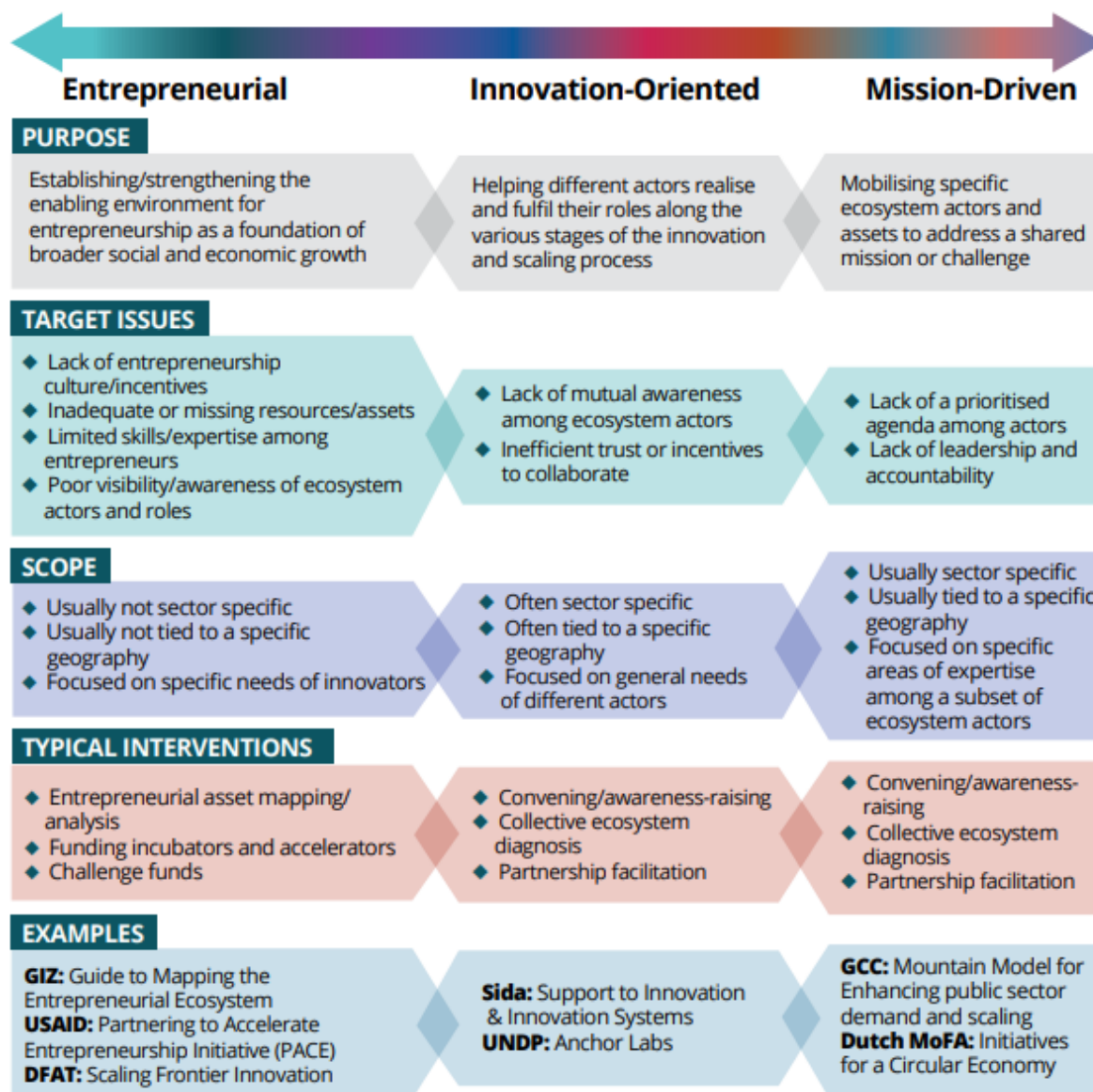


Figure 2: Summary of entrepreneurial, innovation and mission-driven ecosystem approaches (from IDIA, 2021)

2.4 Implications for the Successor Programme

The above discussion suggests that the evidence supports a focus for the successor programme on interventions that target capacity strengthening at the systems-level, including the policy environment and the relationships between various institutional actors in the system, as this represents a gap in current activity, plays to FCDO's strengths and has the potential to generate long-term sustainable change. In practice, this will involve support to individual organisations, but as will be articulated below, this can be deployed in a manner which emphasizes their engagement with systemic processes. In many cases, it will also require investment in capacity strengthening that is embedded in more direct research and/or innovation activities. Through careful design and application of key good practice principles, and by embedding such R&I activity in a coherent framework of systems strengthening, it should be possible to ensure that capacity strengthening is not de-prioritised.

3 Mapping a Research & Innovation system

Before discussing how to intervene in a R&I system effectively we must first consider the various components of the system and how they intersect. **Figure 3** sets out a generalised high-level model of an R&I system divided into four functional domains. While these are presented in a linear fashion, as the subsequent narrative will illustrate, there can be significant feedback loops and complex interconnections between various components.

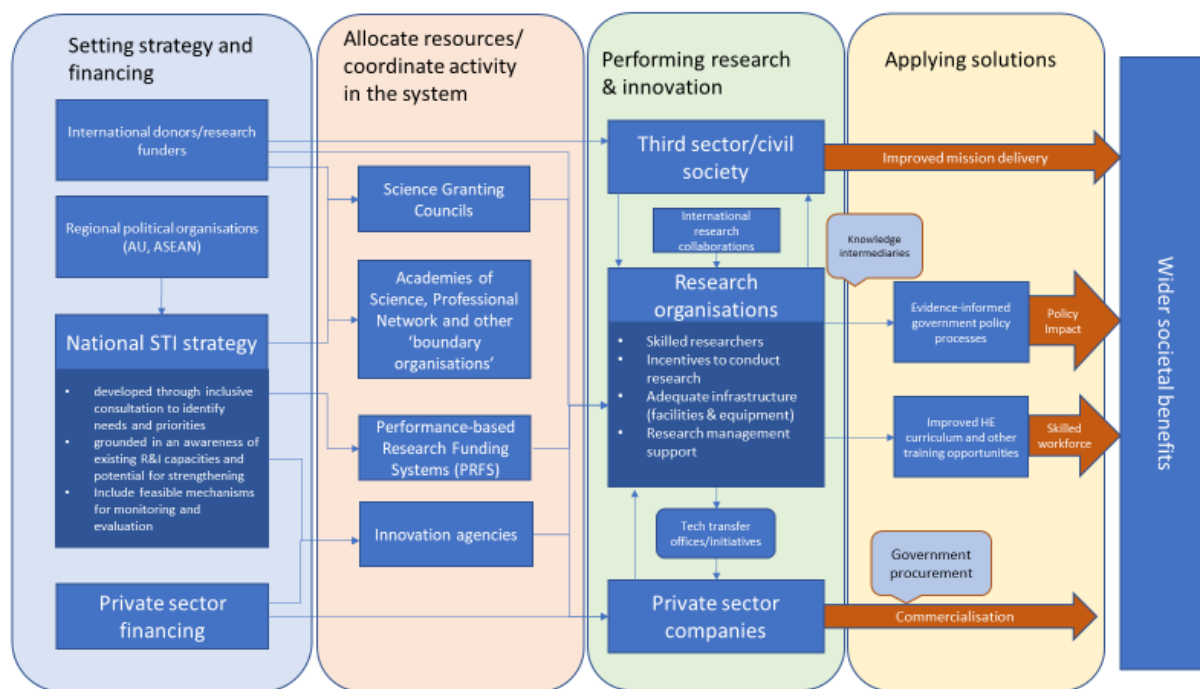


Figure 3: Generalised map of a national R&I system

3.1 Setting strategy and financing

The first set of components includes those institutions which are responsible for setting the overall strategic objectives of the system and financing its implementation, in other words, the institutions that set ‘the rules of the game’. These include national governments, international donors and research funders, regional political organisations and private sector investors. Despite the importance of such institutions in the overall functioning of the system, detailed evidence and analysis of how these institutions function in LMIC contexts is relatively sparse.

Better documentation of sources of funds for R&D is needed. In many countries’ research and innovation systems, foreign funding dominates, especially towards health sciences research. This raises important questions concerning agency and control of innovation systems. Finally, while much is made of the need to measure innovation activities in the informal sector, this remains ‘terra incognita.’ (Kahn, 2022)

3.1.1 International funding organisations

As noted in the quote above, because national LMIC governments are resource-constrained, a substantial portion of funding for R&I activity is often provided by **international organisations**, including bilateral donors, philanthropic foundations, multi-lateral organisations or foreign research funding or performing organisations. As illustrated in **Figure 3**, the funding from these organisations can bypass national institutions with the responsibility for setting agendas and allocating resources and go directly to organisations responsible for performing research and innovation. In fact, even this stage can be bypassed, with international funders funding foreign research organisations to conduct projects, which only engage with local stakeholders for the purposes of data collection and in efforts to apply solutions at the end of the process (and even the application of solutions can be directed at foreign development agencies rather than local stakeholders).

This situation has been the norm for much of the history of development research and innovation support. Efforts to mitigate it, by promoting equitable partnerships and engaging local stakeholders in design decisions (RRC, 2018) are relatively recent in many cases.

Funding from international organisations can bring many benefits, by providing needed resources, and expertise and brokering international collaboration and research partnerships. However, the risks of power imbalances and unsustainability when international funders' priorities shift are substantial. As will be discussed further below, this is an issue in which the FCDO could demonstrate substantial leadership and catalyse transformative change through the successor programme.

3.1.2 National governments

In theory, national governments should be the actors with the greatest capacity to influence the functioning of national R&I systems, this is certainly the case in HICs. The starting point for this is typically through the development of a national Science, Technology and Innovation (ST&I) strategy or policy and the allocation of an appropriate budget for its implementation.

In the synthesis report for the needs assessments conducted for the Strengthening Research Institutions in Africa (SRIA) programme, the authors identified that six of the seven focus countries had national ST&I strategies (i.e. Ethiopia, Tanzania, Ghana, Nigeria, Uganda and Rwanda) with Kenya being the exception (Fosci & Loffreda, 2019). Kenya subsequently published a draft Science, Technology and Innovation Policy in September 2020 and is in the process of drafting a national R&D strategy as part of this. ASEAN countries also generally have recent national STI policies.

However, as will be explored in much more detail in Section 6, there is a great deal of difference between the existence of a national strategy on paper, and the capability of a national government and its respective agencies and institutions to implement that agenda, through resourcing, regulations and legislation.

3.1.3 Regional political organisations

Regional political associations, such as the African Union (AU) and the Association of Southeast Asian Nations (ASEAN), can play a role in aligning national strategies and supporting coherent policy development. Both have championed greater investment in R&I. In Africa, a call for countries to invest at least 1% of GDP in ST&I has been made since the

Organization of African Unity Lagos Plan of Action of 1980, and subsequently re-affirmed at the African Union (AU) Ministers' Conference of 2003, in Africa's Science and Technology Consolidated Plan of Action 2005, and in the 2014 Science, Technology and Innovation Strategy for Africa (STISA) (Kahn, 2022).

In Asia, the ASEAN Permanent Committee on Science & Technology (PCOST) was established in 1971. The association is currently nearing the end of its fifth ASEAN Plan of Action on Science, Technology and Innovation (APASTI).

These regional plans set out a set of priority thematic areas and establish various mechanisms for countries to collaborate and share expertise on the development of policies and activities. However, neither regional strategy includes major direct resourcing for research and innovation activity. In contrast, the European Commission's Horizon Europe programme allocates a budget of 95.5 billion euros for 2021-27 (European Commission, 2021).

Revised strategies for both regions are expected over the next two years, and the successor programme should ensure it is aligned with the ambitions set out within them.

3.1.4 Private sector financing

Increasing the amount of investment from the private sector in R&I is often cited as key to meeting the aspirations of Lower income countries, such as the 1% of GDP invested in Gross Expenditure on Research and Development (GERD). Private sector players have the potential to significantly contribute to the strengthening of an innovation and research ecosystem. Corporates may:

1. partner with academic institutions to drive high-quality research in a sector relevant to the local and global business environment¹³;
2. provide sponsorship and funding support for the commercialisation of research into a new product or service¹⁴;
3. establish local innovation and technology hubs to support entrepreneurs with resources, such as co-working space, providing, amongst others, access to legal and business services and mentoring to guide entrepreneurs in the commercialisation journey¹⁵;
4. leverage their internal innovation capacity to spin new ventures¹⁶;
5. act as corporate venture capital to fund early-stage companies¹⁷;
6. influence policy to offer incentives for new businesses and commercialisation of research (as point 4);
7. support research to improve community well-being through social corporate responsibility programmes¹⁸.

¹³ E.g. <https://www.businessdailyafrica.com/bd/corporate/technology/safaricom-and-huawei-in-deal-with-universities--1985692>

¹⁴ [The Tony Elumelu Foundation - Empowering African Entrepreneurs](#)

¹⁵ [Google to open tech hub in Nairobi as part of Sh115.5bn Africa investment - Business Daily \(businessdailyafrica.com\)](#)

¹⁶ [KPMG True Value Case Study - Safaricom Limited](#)

¹⁷ [Meet the exciting companies Naspers Foundry invested in – Naspers](#)

¹⁸ [Climate Innovation Fund | Microsoft CSR](#)

According to an article published by the World Economic Forum (WEF), '*Private sector companies are more likely to invest resources in Africa if they know governments and other funders are committed to building a sturdy R&D infrastructure on the continent*' (Kariuki, Mutimura & Kadzamira, 2023). A similar sentiment is expressed by the Brookings Institute:

African countries must create an enabling environment through pro-innovation, pro-science, and pro-technology policies dedicated to overcoming barriers related to regulation, corruption, and investment, while enabling private-sector innovation, adaptation, and adoption. At the same time, African governments must also invest in creating an ecosystem that facilitates investment in science and technology in a way that will not just accelerate discovery but allow innovations to enter the marketplace more quickly (Gurib-Fakim & Signé, 2022).

Apart from these generalised positions, our review did not uncover significant, systems-level initiatives to strengthen levels of private sector investment in research and innovation. One sector-specific example of a whole systems approach to fostering innovation (in this case, the use of technology in innovation) is the Mastercard Foundation's Centre for Innovative Teaching and Learning¹⁹. In terms of the design of the successor programme, therefore, at this stage it seems most appropriate for engagement with the private sector to be driven by the activities of institutions responsible for coordinating activities or performing research and innovation within the system, as discussed below.

3.2 Allocating resources / coordinating activity in the system

Between the institutions which set strategic agendas and provide the overall budgets for research and innovation, there exists a set of institutions responsible for the specific allocation of resources to R&I organisations, and/or the coordination of the activity between those organisations. The most prominent of these are Science Granting Councils (SGCs), also known as Research Funding Organisations (RFOs), but they can also include Academies of Science and other learned societies, professional associations, or networks of institutions, such as the African Research Universities Alliance (ARUA)²⁰. They can also include dedicated innovation agencies, such as the Kenya National Innovation Agency (KENIA)²¹.

Such organisations can play a central role in strengthening research and innovation systems. In principle, RFOs are primarily responsible for the effective allocation of research and innovation budgets, traditionally by awarding funds to research and innovation organisations based on competitive peer review processes. These can include funding for advanced training (e.g. PhD studentships and postdoctoral fellowships). RFOs can also be responsible for managing various forms of research infrastructure, including national laboratories, scientific and social datasets, and participation in international facilities.

However, as will be explored in more detail below, they can also perform a more flexible and dynamic role as 'boundary managers':

...science councils work in a much more varied set of systems relating to knowledge, research, technology and innovation. The boundaries of these systems are not strong in many African countries and science councils have a vital role to play in

¹⁹ [Centre for Innovative Teaching and Learning - Mastercard Foundation \(mastercardfdn.org\)](https://mastercardfdn.org)

²⁰ <https://arua.org.za/>

²¹ <https://www.innovationagency.go.ke/>

managing the activities of a broadly defined science system and ensuring it works in the best interest of society. Science councils must therefore embrace a wide range of roles and not just the issue of research funding as is often their focus. This includes roles related to policymaking and influencing the policy process (Hanlin, Sheikheldin & Tigabu, 2021).

The role of boundary manager is also shared by the other types of institutions included in this category. There is no one correct structure of organisations to occupy this space, and this will vary depending on the institutional history and political economy of individual national contexts. For example, in many countries, the function of an RFO may be embedded within a ministry of higher education and/or science, or it may be performed by an arms-length, substantially independent body. Separate entities may exist for different research disciplines (as was the case in the UK until the recent formation of UKRI), or for research and innovation (as is the case in Kenya). Debates may be had concerning the correct configuration of such organisations, involving important considerations of, for example, the balance between the coherence of national strategies, government priorities and academic independence. These are best engaged in by local stakeholders, rather than imposed from outside, though international partners may play a role in facilitating these discussions.

3.3 Performing research and innovation

The core of any R&I system are the organisations which directly conduct the research and innovation activity. These are often universities which combine research with higher education at the undergraduate and postgraduate levels. But they can also include dedicated research organisations such as laboratories or think tanks.

Employing highly skilled research staff is only one component of an effective research organisation. They must also be well-managed, and resourced and work in an enabling environment. A chief concern for many researchers in LMIC universities is having adequate time and incentives to conduct research, as teaching requirements can be burdensome. Other factors include dedicated research management support, to identify and support applications for research funding, as well as to support the management of research projects, which can often be large and complex and/or subject to onerous reporting requirements.

Access to laboratory space and accompanying technical staff, equipment, datasets, computing power, digital public architecture and internet access are all central to the conduct of research, though specific requirements of course vary across disciplines and methods. Access to relevant scientific literature is also essential, so ensuring open access to scientific publications is a key challenge. Research organisations also require robust processes for research ethics review, to ensure safeguarding for research subjects (and researchers themselves) and to guard against various forms of research misconduct.

Research often also requires effective collaboration between multiple organisations, whether to conduct research directly, to share data, to identify research priorities or apply research outcomes. This collaboration can occur locally, nationally or internationally, but both researchers and the leadership of research organisations need opportunities to engage and build relationships across organisations.

Particularly when considering innovation, but also with research in some circumstances, it is important to recognise that formal research organisations are not the only places in which

R&I activities occur. Governments, NGOs, CSOs and private sector companies can conduct R&I themselves, and can often be important partners for research delivery, by helping to define relevant research questions, providing or supporting the collection of data, and implementing solutions.

Fostering collaboration between actors in this domain is a critical role for the 'boundary managers' mentioned in the preceding section. However, it is important to note that this function can also be embedded within research-performing organisations themselves, through tech transfer offices, government and civil society liaison offices, and public engagement policies.

In summary, to foster an effective R&I system, support to research organisations cannot be limited simply to direct funding for project-based research activity.

4 Summary of Backward-Looking Key Informant Interviews (Stage I)

This section summarises input from 12 anonymous interviews conducted with internal FCDO stakeholders and external groups, such as the International Development Research Centre (IDRC), the National Research Foundation (NRF-South Africa), African Centre for Technology Studies (ACTS), Science for Africa Foundation, Chemonics/RISA Fund, Innovate UK (UKRI), Results for Development (R4D), OECD and several parts of FCDO itself. A full list and summary of organisations that were interviewed as part of the stage I interviews can be found in Table 4.

These interviews are backward-looking in the sense that they cover the understanding of key stakeholders, especially funders, about support to R&I Systems to date. They actually have quite forward-looking implications since they propose challenges that need to be addressed going forward.

Table 4 List of stakeholders engaged in stage I interviews

No.	Organisation Name	Type of Organisation	Relevant programme
1.	International Development Research Centre (IDRC)	Canadian Government funder	SGCI
2.	National Research Foundation (NRF-South Africa)	Independent research agency	SGCI
3.	African Centre for Technology Studies (ACTS)	Research organisation	SGCI & ATIP
4.	Science for Africa Foundation	NGO	DELTAS
5.	Chemonics	Delivery partner	RISA, SRIA & ATIP
6.	Innovate UK	UK Government Agency	SRIA & ATIP
7.	Results for Development (R4D)	Non-profit global development agency	RISA
8.	OECD	International funder	N/A
9.	FCDO (internal stakeholder)	UK Government department	ACBI, SGCI
10.	FCDO (internal stakeholder)	UK Government department	GRP
11.	FCDO (internal stakeholder)	UK Government department	SGCI
12.	FCDO (internal stakeholder)	UK Government department	SRIA + ATIP

4.1 FCDO Unique Selling Points (USPs)

There was a clear perception that FCDO enjoyed a special position in terms of its potential impact on R&I Systems.

-
- Convening power and networks, especially through FDCO's local country presence, but also through its global presence
 - Diplomatic links with governments at high levels
 - Openness to experimentation and flexibility
 - Ability to bring together different funders and work with different types of partners to mobilise different types of money
 - Unlike other international funders, there is no requirement for South researchers to collaborate with the UK on FCDO-funded programmes so they can focus on South-South collaborations
 - Openness to work with the private sector (both businesses and foundations)

4.2 What has worked well

SGCI, RISA, GRP and DELTAS were all seen as working well in many ways.

1. SGCI

- Intra-Africa collaboration
- Co-funding with other Northern funders (IDRC, NORAD, SIDA)
- Interventions are aligned with national development plans so that research outputs provide solutions to local problems
 - Bilateral partnerships, especially with IDRC as an implementing partner
 - Allowing countries to set their own research priorities
 - Not imposing a requirement for collaboration with researchers based in the funder's country
 - African governments starting to co-fund projects
- Engaging the private sector
- Embedded MEL component, monitoring performance and allowing adaptable programming

2. SRIA, ATIP and the RISA Fund

- Inter-Africa collaboration
- R&I being managed together from a risk and stakeholder relationship perspective
- African governments starting to co-fund projects
- Strengthening the capacity of the institutions through technical support
- Engaging with the private sector through KTN

3. GRP

- Trilateral partnerships
- The programme has generated high-quality science outputs.
- The collaborative nature of GRP has proved to be very effective in addressing development challenges through research.

4. DELTAS

- Hub/Spoke model seemed very successful in its approach to using a peer-to-peer model to build capacity and create a legacy through partnerships
- Successfully implemented EDI strategies

5. ACBI

- Engaging Academies of Science is good because they support evidence-informed decision-making and provide an important critical challenge function
- Focusing on technology transfer and commercialisation

4.3 Gaps and other opportunities to consider

- Consider implementing the Good Financial Grant Governance Program (GFGP) standards for universities and other grantees
- Expand the RISA Fund model to other geographies
- Invest in capacity strengthening for funding agencies
- Strengthen the Research and Innovation Manager role within universities
- Supporting countries to create innovation agencies (only some have these) – this could come out of expanding SGCI
- Grants to encourage the research diaspora to return (opportunity)
- Programme to bring innovation from Africa to the global north (opportunity)
- Leverage AI in collecting and analysing programme data for informed decision-making; there is an opportunity to build the capacity of member states to gather data on R&D / STI across countries (build on what has already been done through SGCI)
- Explore different (non-western) commercialisation pathways – commercialisation and translation of research were cited as both a need and gap, but there was a question over whether Western models are fit for purpose.
- From an innovation perspective, consider engaging with SMEs who have innovation potential, not just startups

4.4 Important considerations for future programmes

- Focus on local engagement and local impact - several interviewees mentioned focussing on local context/ needs and prioritising depth over breadth.
- Some interviewees suggested going beyond the well-developed ecosystems of Kenya and South Africa to support the rest of the continent, while others said FCDO would bring the most impact in countries with a medium and high level of development.
- Flexibility was also mentioned a few times – this included how to measure success but also in offering flexible or more than just grant funding
- Prioritise depth over breadth, i.e. smaller number of geographies (from an SGCI perspective)

4.5 Sustainability

- A successful approach is the Science for Africa Foundation's Hub and Spoke model which is already creating a sustainable impact on the participants, even if the programme doesn't continue
- Consider co-funding models with private Foundations, Corporations and national government funding
- Establish cross-country/ cross-institutional collaboration to build sustainability

5 Benchmarking

5.1 Methodology

The benchmarking table captures information on international funders and relevant programmes that helped inform the design of FCDO's successor programme. The information provided is available publicly, through funders' websites and annual impact reports, and was collected through desk-based research.

The selection of funders for benchmarking is based on an initial long list (**Error! Reference source not found.**) that covered organisations suggested by the FCDO, funders mentioned in interviews by the different stakeholders engaged, and those found to be relevant through Oxentia/OPM teams' own desk-based research. While we wished to include all 19 funders identified in the benchmarking analysis, time constraints required us to prioritise and select a subset. The selection process took into account geographical diversity, and relevance to the project, i.e. funders working to strengthen R&I systems, rather than individuals/institutions, were prioritised. The selection process also ensured the shortlisted organisations covered both the private and public sectors. For each funder included in the benchmarking, we chose the most relevant programmes based on the following criteria: i) relevance or similarity to successor programme interventions, ii) focus on R&I systems strengthening, iii) focus on South-South collaboration where applicable, iv) focus on ASEAN and African geographies.

Table 5: List of organisations considered for benchmarking and sources

No	Funder	Source	Included in the benchmarking
1	USAID	FCDO suggestion	Yes
2	World Bank	FCDO suggestion	Yes
3	IDIA	FCDO suggestion	No
4	IDRC	FCDO suggestion	No
5	Science for Africa Foundation	FCDO suggestion	Yes
6	African Research Universities Alliance	FCDO suggestion	No
7	Japanese International Cooperation Agency (JICA)	FCDO suggestion	Yes
8	Swedish International Development Agency (SIDA)	FCDO suggestion	Yes
9	Norwegian Agency for Development Cooperation (NORAD)	FCDO suggestion	Yes
10	DFG - German Research Foundation	FCDO suggestion	No
11	Gates Foundation	FCDO suggestion	No
12	Wellcome Trust	FCDO suggestion	No
13	UNESCO	Interviews	No
14	Mastercard Foundation	Interviews	Yes
15	Unilever	Interviews	Yes
16	Science Foundation Ireland	Interviews	Yes
17	AUDA-NEPAD	Interviews	No
18	AU STISA	Interviews	No
19	UNDP	Interviews	Yes
20	Essence network (WHO)	Literature review	No - covered in earlier report sections
21	Carnegie Corp	Literature review	No - covered in earlier report sections
22	The Korea International Cooperation Agency (KOICA)	Own research	No
23	Catapults' international programmes	Own research	Yes
24	UNSSC	Own research	Yes

5.2 Benchmarking analysis summary

The benchmarking analysis reveals a diversity of systems-strengthening approaches at the international level that go beyond research funding, most of which focus on whether the research or the innovation component:

- Strengthening local financial organisations in building offerings tailored to women entrepreneurs (World Bank/IFC)
- Building local innovation and research hubs that engage local entrepreneurs and researchers in solving country-specific economic issues (UNDP, Science for Africa Foundation, Catapult Network)
- Convening public and private sector stakeholders to build partnerships to address R&I strengthening challenges (UNOSSC, Unilever, Mastercard)
- Establishment of open innovation funds (USAID)
- Running Challenge-based programmes to support the best innovation initiatives that target local needs (USAID, Science for Africa Foundation, Unilever)
- Supporting local government's engagement with innovation through better public procurement of innovation (Mastercard).

This analysis reveals areas of systems strengthening where FCDO could partner with other international funders, e.g. with UNDP in the implementation of an LMIC catapult-like network of local hubs driven by country priorities, as well as potential gaps where FCDO could leverage the UK's expertise in R&I interventions to add value to local ecosystems, e.g. the development of a PRFS to provide additional mechanisms to finance R&I strategies, and establishing frameworks and processes for better government procurement of innovation and research.

6 Problem Statement

One way to approach the challenge of capacity-strengthening in Lower income countries is through the lens of the ‘innovation paradox’. The term is used to refer to a wide range of puzzling economic phenomena related to innovation (Fragkandreas, 2017). Here we are concerned with its application to LMIC contexts as articulated by the World Bank (Cirera & Maloney, 2017).

The paradox can be summarised as follows. Economic growth theory states that innovation is one of the most important factors driving productivity and has historically been critical to how countries achieve prosperity. Furthermore, the return on investment from promoting innovation should be greater the further countries and firms lie from the global frontiers of innovation, as it should be cheaper to absorb and adapt technologies and processes which exist elsewhere than to create entirely new ones. However, Lower income countries invest far less than HICs in innovation. *‘Firms and governments appear to be leaving billions of dollars on the table in foregone productivity growth and lost competitiveness’*(ibid.: xix).

The explanation for this paradox is not that decision-makers in Lower income countries are irrational or unaware of the potential returns from investment in innovation. Rather, low investment is driven by the absence of a broad set of complementarities which more than offset the potential gains. To address these, the authors note:

...innovation in the developing world faces barriers that are orders of magnitude more challenging than those found in the advanced world. Thus, fostering innovation requires a rethinking of innovation policies along three key dimensions.

First, the importance of a wide range of innovation complementarities implies that the scope of the NIS that policymakers must keep in mind is much larger than in advanced countries and must include everything that affects the accumulation of all types of capital—physical, human, and knowledge—and their supporting markets. What looks like an innovation problem, such as a low rate of investment in R&D, may reflect barriers to accumulating other factors, including physical and human capital.

Second, firm managerial and technological capabilities are a central complementarity to narrowly defined innovation expenditures, and their cultivation is critical to fomenting a continual process of technological adaptation and quality upgrading. This implies a rebalancing of policy priorities toward management and technology extension instruments and away from a focus mostly or exclusively on promoting R&D. Although R&D is an important input for innovation, it requires a set of capabilities that are unlikely to be prevalent in developing countries and its promotion cannot be at the expense of the other investments in the capabilities escalator.

Finally, the complexity and problems in constructing a functional NIS and building private sector capability are greater in developing countries, whereas government capabilities to manage them are weaker. Innovation policy thus needs an honest balancing of capabilities with tasks, which requires working on a selective set of issues rather than trying to import a full set of institutions and policies from elsewhere

National governments will be incentivised to invest in research and innovation if there is a compelling case that such investment represents value for money within their national contexts, and there are clear models and international support networks to enable investments to be made effectively and efficiently.

The challenge for a systems level capacity strengthening programme is how to foster the complex network of institutions, policies and strategies to enable R&I systems to flourish, without relying on trying to simply import northern models which are not appropriate to LMIC contexts.

6.1 Theory of Change

A diagram for a high-level Theory of Change is presented in Appendix 1 – Proposed Successor Programme Theory of Change. Given the above articulation of the central capacity challenge for R&I systems, we can describe the intended **impact** of the successor programme as contributing significantly to ***‘robust, globally engaged national R&I systems able to effectively identify and address R&I priorities for sustainable development’***.

The key assumption is that such systems will encourage substantial internal and external investment in innovative solutions to a wide range of societal challenges, fostering sustainable economic growth and prosperity by improving productivity, promoting greater equity and social inclusion through more effective public services and improving resilience to both environmental and economic shocks. Of course, these results will require the existence of a political economy environment that is committed to addressing such challenges. The point is that if such political will exists, robust R&I systems will provide powerful levers for national governments to pursue the priorities they set.

In many LMIC contexts, given the low levels of domestic investment, international funders play a substantial role in financing and, consequently, setting the agenda for R&I activities. Therefore, the **first key outcome** which will contribute to the intended impact of strengthened systems is to improve the extent to which ***‘the international R&I funding community provides strategically coherent and effective support to LMIC R&I systems’***. FCDO can play a substantial role in bringing a range of international (and national) actors together to ensure consistent application of key principles, such as fostering equitable partnerships, enabling continuous and shared learning on best practice in R&I capacity strengthening, and aligning funder activities so that they can identify opportunities to strategically target complementary aspects of R&I systems.

In the long term, however, the health of R&I systems will be dependent on leadership and resourcing from their national governments, which is also essential to the legitimacy of strategic R&I agendas. Therefore, the **second key outcome** for the successor programme should be to provide support so that ***‘LMIC national governments can design, deliver and resource effective R&I strategies and monitor their implementation’***. This includes both the capacity of governments to set feasible R&I strategies which address the most pressing challenges facing their societies and the strengthening of the policy mechanisms through which those strategies can be implemented.

In practice, there should be substantial overlaps between the activities pursued at the national and international levels. The determination of best practice approaches and the setting of strategic priorities for international funders should be steered by the perspectives of local stakeholders, and the expertise, analytical and evaluative tools developed and used by international funders should be shared with local policymakers.

Effective national strategies and policy environments can only deliver impactful research and innovation where there is a wider ecosystem of organisations with the capacity to deliver R&I. Also, given that the R&I process is complex, involving multiple stages and requiring a wide range of different skills sets, from fundamental problem-solving to delivery of economically viable solutions at scale, high levels of communication and collaboration between diverse organisations are essential. Therefore, a **third key outcome** for the successor programme is to provide support so that '***R&I organisations have the capacities, resources and interconnections needed to deliver national R&I agendas***'.

In providing organisational-level support, the successor programme will need to address two contrasting observations. The first is that effective organisational capacity strengthening can be resource and time intensive, and therefore to achieve sustainable change interventions should avoid spreading themselves too thinly. The second is that there is still much that is not understood about how to effectively strengthen capacity in diverse LMIC contexts, and that the effectiveness of interventions can be highly sensitive to local contexts. We therefore propose a two-pronged approach to achieving this outcome, which would combine top-down larger-scale strategic investments (modelled on interventions such as DELTAS and catapult centres) with more open bottom up project calls.

The activities and outputs required to deliver these outcomes are considered in detail over the course of the following three sections of this report.

7 Strategic challenge 1: fragmentation of donor support

7.1 Problem description

Given the generally low levels of national government support for research and innovation in most LMIC countries, a substantial proportion of R&I investment comes from international donor agencies, including governmental development agencies and non-governmental philanthropic organisations.

The external nature of funding creates several challenges to the strengthening of local R&I systems. First, donors have their own agendas and constraints which can result in fluctuations in funding and short-term thinking (UKCDR, 2022). Second, donor agendas may or may not align or be coherent with those of national and local governments and stakeholders. Third, a diverse donor landscape and tendency to work in silos can reduce the coherence of delivery and constrain knowledge sharing and the adoption of good practice in supporting capacity strengthening. This lack of coherence is problematic because no one external funder is able to support the strengthening of an entire system. Given, as noted in the previous section, various components of an R&I system are closely interrelated, coordination between donors, and between the actors engaged with different system components is essential. Evaluations and reviews of capacity strengthening programmes usually include sets of general recommendations for funders to strengthen future programmes. Examples of these are provided in **Table 6**.

Several organisations already exist which seek to coordinate activity among international research and innovation funders. For example:

- the International Development Innovation Alliance (IDIA), established in 2015, brings together 15 organisations, including bilateral and multilateral donors and private philanthropic organisations. Its goal is '*actively promoting and advancing innovation as a means to help achieve sustainable development*'²².
- The UK Collaborative on Development Research (UKCDR) is a collection of UK government organisations which allocate UK ODA-funded research budgets, and the Wellcome Trust. It includes a dedicated member group concerned with research capacity strengthening.
- ESSENCE on Health Research is an initiative that allows donors/funders to identify synergies, establish coherence and increase the value of resources and action for health research²³. It includes 30 member organisations, 12 observers and is hosted by the WHO/TDR.
- The Global Research Council (GRC) is a virtual organisation, comprised of the heads of science and engineering funding agencies from around the world, dedicated to promoting the sharing of data and best practices for high-quality collaboration among funding agencies worldwide²⁴. It does not explicitly reference capacity-strengthening in its purpose, but does aim 'to be a resource for those institutions wishing to build a world-class research landscape'.

²² <https://www.idiainnovation.org/about-idea>

²³ <https://tdr.who.int/groups/essence-on-health-research>

²⁴ <https://globalresearchcouncil.org/about/global-research-council/>

Table 6: Examples of recommendations for funders from RCS evaluation

Source	Recommendations
<p>Research capacity building—obligations for global health partners (Beran, et al., 2017)</p>	<ul style="list-style-type: none"> • Ensure global health funding awarded to HIC institutes has a LMIC research capacity building element, especially training of LMIC researchers • Ensure calls reflect local needs, rather than HIC funder interests • Mandate that proposals are developed in equal partnership with LMIC researchers and institutes • Increase funding for epidemiological, qualitative, and health system work to understand local burden of disease, health care beliefs, and other local contexts • Ensure plans for hand-over of infrastructure in Lower income countries within a realistic, predetermined timeframe • Mandate that funding panels attain balance in assessors from Lower income countries and HICs
<p>PASGR’s Professional Development and Training Programme: Evaluation Report. (2019)</p>	<ul style="list-style-type: none"> • Donor support has enabled wider participation in the PDT Programme’s trainings. However, the funding is only available to a limited number of participants, and is tied to donor priorities and earmarked for strategic focus countries. This limits the programme’s reach and ability to target needy participants, especially from academia. • The PDT Programme should strengthen collaboration and nurture strong relationships with partner institutions, including donors, by promoting a culture of reflection and learning. Regular feedback to donors is key to establishing sustainable partnerships, driving momentum and creating greater interest in PASGR’s work.
<p>A narrative review of health research capacity strengthening in low and middle-income countries: lessons for conflict-affected areas (Bowsher, et al. 2019)</p>	<ul style="list-style-type: none"> • Meanwhile, the ability of LMIC researchers and research groups to access financial resources from international funding bodies and donors is hampered by asymmetries in how grants are allocated, requirements for partnerships with Northern institutions, and the disbursement of funds within such partnerships
<p>Building and evaluating Research Capacity in Healthcare Systems: Case Studies and Innovative Models (Edwards, Kaseje and Kahwa, 2016)</p>	<ul style="list-style-type: none"> • Agreement among funders to adopt well-validated measures for indicators across funded initiatives would support benchmarking and a deeper understanding of capacity-building initiatives that work. Priority indicators for this purpose include those targeting networking, leadership and governance structures, since indicators in these domains are largely absent from accountability frameworks (p. 246).
<p>Building capacity for applied research to reduce tobacco-related harm in low- and middle-income countries: the Tobacco</p>	<ul style="list-style-type: none"> • First, it is important that funders provide ongoing opportunities to support researchers and research teams in Lower income countries to sustain and grow the research and networks that have been established within this and similar programmes.

Source	Recommendations
Control Capacity Programme (TCCP)	
<p>Strengthening national health research systems in Africa: lessons and insights from across the continent (Jones, et al, 2021)</p>	<ul style="list-style-type: none"> • Support local ownership and governance of HSR (health sciences research) <ul style="list-style-type: none"> ○ Define terms and conditions of partnership that secure local benefits ○ HSR international collaborations must have explicit objectives to strengthen local capacity ○ Establish formal collaboration mechanisms and arrangements between sectors for HSR • Build local infrastructure for HSR—including regulatory bodies, ethics committees, technical platforms, laboratories, and data management systems <ul style="list-style-type: none"> ○ Invest in national research institutions and improving technical platforms for HSR ○ Strengthen resources and capacity for ethical review of HSR ○ Centralised national repositories can track funding, investments, partners, projects, data and results • Cultivate a national scientific research culture and HSR career pathways <ul style="list-style-type: none"> ○ Local knowledge exchange platforms can share results and create demand for HSR ○ Encourage, equip and mentor high-quality, skilled health sciences researchers ○ Local research leaders can advocate for political prioritisation and funding commitments

In recent years, these organisations and others have produced numerous publications which provide guidance and recommendations to funder organisations on how to effectively support R&I capacity strengthening (e.g. UKCDR, 2022, ESSENCE, 2023, IDIA, 2015, Khisa, et.al. 2019) and evaluations and systematic reviews of capacity strengthening interventions typically include lessons learned and sets of recommendations (e.g. Bowsher, et al. 2019, Casell, et al. 2022).

However, there is an absence of evidence, outside the efforts of the ESSENCE network, that these guidelines and recommendations are systematically implemented by funders. For example, UKCDR (in its previous incarnation as UKCDS) published guidance on research capacity strengthening as far back as 2012. Despite this, the UK’s flagship ODA research investment of recent years, the Global Challenges Research Fund (GCRF), never developed an overarching framework or definition for capacity strengthening, even though one of its three strategic objectives was to: ‘*Strengthen capacity for research, innovation and knowledge exchange in the UK and developing countries through partnership with excellent UK research and researchers*’, While the GCRF evaluation notes that a wide range of capacity building outcomes were achieved, these were predominantly at the individual level.

The GCRF programme also required the participation of UK-based researchers in its funded projects. While North-South research collaborations can be an important route through which LMIC research capacity is strengthened, they create the risk of unequal power relationships and raise complex sets of administrative, ethical and strategic challenges which require experience and expertise to navigate. While the principles of equitable partnerships have received significant attention recently (RRC, 2018) these are not yet systematically and robustly implemented by funders, and the burden of managing such partnerships can be delegated to research teams themselves. A report from one GCRF project on medical technologies noted:

The experiences of the OLI project highlight important ethical challenges that range from the structure of the grants to the design of contextually appropriate technologies. ... these different areas of ethical concerns are currently covered by a range of different frameworks and/or fields of discourse ... unified discussions that demonstrate how these areas are simultaneously enacted within a research context are lacking. This can leave researchers not only confused about how to respond to the differing commitments implicit in their grant but worried that they are continually failing to live up to expectations.

... Relying solely on individual researchers with no prior experience of capacity-building activities is inappropriate and could undermine both research and development agendas. Indeed, shifting responsibility for mitigating research neo-colonialism onto researchers undermines both the efficacy of the research-as-development agenda and brings into question the extent to which decolonization is a priority of funding councils and the governments that fund them (Bezuidenhout, et al., 2022)

Overall, there is a need for coherent and systematic frameworks to assess national research capacity, identify priority areas for investment and provide a baseline to assess the collective impact of various R&I capacity-strengthening efforts.

7.2 FCDO's added value

FCDO is in a particularly strong position to influence the wider international donor community to produce greater alignment. It has established collaborative relationships with many of the most significant international organisations investing in R&I capacity strengthening. The willingness of the FCDO to partner with other organisations, and its convening power was cited by several interviewees as a key strength compared to other funders.

FCDO's strong links with the wider donor community are complemented by its long-term established relationships with LMIC governments. It is thus well positioned to convene a greater dialogue between international funders and national governments, to strengthen the alignment of donor and local agendas and priorities.

As is described below, existing efforts to coordinate activity among R&I capacity strengthening funders is largely limited to the health domain. As its remit includes health, but extends well beyond this, the FCDO could play a critical role in adapting the lessons learned and progress made in the health field to other sectors.

7.3 Potential interventions

Intervention 1: Establishment of an active funders forum to coordinate activities and strategy

The ESSENCE Health Research Initiative includes more than 40 agencies that fund health research capacity-strengthening in Lower income countries. The initiative has noted that *'multiple partners are engaged in efforts to strengthen health research capacity in LMIC, but currently, there is no system for reviewing investments and coordinating efforts'* (Kilmarx, et.al. 2020).

In response to this observation, ESSENCE established a working group which identified four key findings (see **Box 1**).

Box 1: Findings of the ESSENCE review mechanism working group

1. Establishment of a mechanism for reviewing investments in capacity strengthening for health research in Lower income countries would provide a common set of principles, metrics, data, and standards to better inform investment decisions. This would encourage greater synergy and enhanced coordination of funders of health research, research organizations, users of clinical research, and other key actors and improve stakeholder engagement.
2. The main barriers to setting priorities and coordinating health research capacity-strengthening activities include the lack of a) quality data on what health research and capacity-strengthening programs are being conducted or planned, b) a shared set of metrics and quality data on current capacities at institutional and national levels, and c) a forum where sharing of information and coordination can take place.
3. Data-sharing systems should be sufficiently comprehensive to meet stakeholders' needs but not too complex to be efficiently and cost-effectively implemented, maintained, and kept relevant.
4. The organizational entity or entities for the review process should maintain an LMIC focus with representation from Lower income countries, organizational agility and responsiveness, and neutrality, achieving collective accountability in a way that is non-threatening yet effective.

The conclusions of the ESSENCE working group are reiterated by others. According to a recent UKCDR report:

'...one way to address coherence is to advance a common language, framework and tools amongst funders and practitioners. The collaborative nature of RCS approaches translates into complex interactions of multiple actors and activities at various levels, in a process that is often dynamic, long-term and context-specific...Within development research, a holistic and coordinated approach to RCS should inform how interventions are designed, implemented, and evaluated. Funders and practitioners benefit from sharing learning about what works in RCS is different contexts' (UKCDR, 2022).

Similarly, a recent analysis of monitoring and evaluation approaches of four consortia funded through DELTAS I noted that:

Although RCS programmes have common areas of interest and overlap, there has been very little effort to harmonize ways to measure their effectiveness. This means

that many opportunities have been missed to learn from comparisons across programmes and consortia (Kasprowicz, et al., 2023).

Similar sentiments on the need for greater coordination in measurement have been expressed in the innovation sphere.

Greater investments are needed to make it possible for development agencies to share diagnostics and measurement frameworks and better understand how and where progress is being made toward innovation system strengthening, in terms of relationships, partnerships, trust in institutions and other more nuanced areas required to enable local innovation. (IDIA, 2021: 6)

Existing work provides the foundations for this harmonisation. For example, **Table 7** sets out a capacity-strengthening evaluation framework developed by the Centre for Capacity Research (CCR) at the Liverpool School of Tropical Medicine (LSTM) and the African Population and Health Research Centre (APHRC) (Khisra, et al., 2019). This framework sets out numerous indicators at all three system levels. These indicators include both quantitative and qualitative measures, some of which may be challenging to measure systematically or may only be observable long after programme funding has been completed.

To ensure such frameworks are utilised effectively and effectively, however, this requires the existence of institutional frameworks which systematically incorporate this knowledge into the design and implementation of capacity-strengthening programmes and draw on insights from these programmes to revise and refine the guidelines. The ESSENCE network provides this in the health sector but a network dedicated to capacity strengthening outside of health does not seem to actively exist. The IDIA is limited to innovation, UKCDR is limited to UK-based funders and the GRC does not proactively pursue capacity strengthening. UKCDR's website describes an International Research Development Funders Forum (IRDFF) established in 2017, but the information does not appear to have been updated since 2019. The International Science Council (ISC) appears to have established a Global Forum of Funders in 2020, but internet links to it appear to be broken.

Therefore, our first recommendation for the successor programme is that FCDO establish a formal network or forum for both public and private funders of research and innovation capacity strengthening to coordinate activities.

Such a forum could be established independently or could be incorporated into an existing multi-national organisation or network. Its first key priority would be to align funders' approaches to conceptualising, monitoring and evaluating capacity-strengthening efforts. With dedicated core funding for a secretariat such a forum could go well beyond the publication of guidance by working to operationalise existing recommendations on the harmonisation of M&E activities and establish a learning framework so that these could be continuously refined in light of new evidence.

Key activities of the forum could include:

- Comprehensive mapping of current and past capacity-strengthening interventions by member organisations
- Detailed capacity needs assessment and baseline profiles for countries and research organisations (see also Section 6 below)
- Harmonisation of methods for capacity strengthening evaluation, with regular systematic synthesis of lessons learned. This could include an assessment of long-term impacts

after individual programmes have closed, and collective impact of multiple programmes by different donors

- The provision of training, particularly to LMIC government officials, researchers and consultants in capacity-strengthening and M&E of capacity-strengthening

One opportunity for funder collaboration that this work has already identified is a potential partnership between FCDO and the World Intellectual Property Office (WIPO) to strengthen the capacity to protect and exploit intellectual property from research in LMIC. An interview with WIPO's head of technology transfer revealed many strategic synergies between the two organisations, such as 1) collaborating to convene stakeholders on multi-country programmes such as [the Enabling Innovation Environment \(EIE\) Project for IP and Technology](#) and 2) coordinating to support low-income countries, such as Cambodia, Brunei, Sri Lanka where the need for support is greatest, with local leaders in IP (e.g. Thailand) to facilitate knowledge exchange. A potential partnership with WIPO is explored in more detail in Section 8.3.

Table 7: RCS evaluation framework with examples of indicators

Target level for RCS	Examples of indicators
Individual level	
Provision and quality of training for the research team	Quality of graduates from RCS programmes (e.g. technical capability, critical thinking skills, confidence, empowerment, employability) appropriate for career stage Individualised training needs assessments conducted and reviewed
Recognition of research leadership/esteem	Increase in confidence and empowerment to take leadership positions Able to create and/or manage multi-disciplinary teams
Career trajectory	Evidence of progressing in a chosen career Number of networks and collaborations joined or initiated
Institutional level	
Career pathways for the research team	Transparent, equitable promotion criteria and processes, and career progression Mentoring scheme (inter-generational) available and effective
Sustainable provision of appropriate, high-quality training	Students' completion, progression and employment rates Quality and sustainability of courses and graduates including multi-disciplinary capability
Nationally/internationally competitive research and grants	Consistent, high-quality research productivity (grants, publications, patents, start-ups, commercialisation) Ability (or on a trajectory) to support the 'research pipeline' from basic science to community/ behavioural
Research environment—finance, library, IT, labs etc.	RCS strategic plan, with funding, implemented and monitored % of budget spent on strengthening research systems
Societal (national/international level)	
National: research councils/research productivity	Ability to manage transparent, efficient and competitive processes for allocating national research funds Research productivity (funds, publications, patents) + trends
International: networks/collaborations	Research hubs – number, diversity, esteem, infrastructure International mentorship
Research impact and user engagement	Research-influenced policies Innovations that impact on society

Provision of training is important as the evaluation of R&I capacity strengthening initiatives is a specialised, complex task and standard practices for the evaluation of development interventions more broadly may need to be adapted and refined. It would very much be in

the interest of R&I capacity strengthening funders to expand the market of suppliers with expertise in evaluating such programmes, as well as to strengthen the capacity of those responsible for internal M&E of programme delivery. A recent paper analysing M&E efforts within four DELTAS consortia projects noted:

Additional guidance or training for those involved in designing and implementing M&E plans would be beneficial to help increase qualitative data capture around RCS efforts. Specialists with qualitative research skills could help to obtain the robust/high-quality data needed to influence a change in approach to learning about how to improve RCS. M&E efforts could be further enhanced by supporting platforms and activities for cross-consortia sharing and brainstorming: to design appropriate data capture tools, develop relevant indicators and assess more complex RCS effects such as sustainability and impact. The refinement of best approaches to evaluate consortia is vital, especially as RCS efforts further develop, and investment in platforms to support these efforts and this community of practitioners should be encouraged, including online learning platforms and the use of online data capture options. Consortia should ensure that processes for learning are in place, that learning is documented and that it is shared to benefit others when possible (Kasprowicz, et al., 2023).

Coordinating funder activity for M&E could provide opportunities for more cross-cutting strategic assessments of impact beyond the boundaries of individual programmes. For example, assessments of R&I capacity strengthening are often conducted in a time frame which only allows for the review of short-term outcomes (Cassell, et.al., 2022 notes this and represents a rare exception). A consortium of funders could provide the resources to conduct follow-up assessments after longer time periods. They would also have the capability to consider the cumulative impacts of interventions by multiple funders in the same geographies and/or sectors.

8 Strategic challenge 2: Implementation and assessment of national Science, Technology and Innovation (ST&I) strategies

8.1 Problem description

From a long-term perspective, improving the effectiveness of international donor investments is only an intermediary solution to the challenges of weak R&I systems in Lower income countries. Ultimately, the success of R&I systems strengthening should be measured by the extent to which the resulting systems provide a sufficiently clear return on investment that governments take full ownership of their resourcing and strategic direction. The literature describing capacity strengthening interventions also frequently notes the importance of encouraging national investment in R&I. For example:

(It) is also important to conduct sustained advocacy to convince national and local governments and legislators to provide some core funding for research capacity building and South-South collaborative efforts if they are to have long-term sustainability (Agyepong, et al., 2022:10)

The need to invest more in R&I capabilities has long been acknowledged by LMIC governments. As noted in section 2 above, African countries have been reiterating a commitment to spend 1% of GDP on R&D since 1980. However, not only has no African country yet succeeded in meeting this target, in the most recent African Innovation Outlook (2019) published by the AU, only seven countries (Botswana, Eswatini, Ethiopia, Mozambique, Namibia, South Africa and Uganda) were able to report full statistics on Gross Expenditure on Research & Development (GERD) (ASTII, 2019). Additionally, cross-country comparisons are difficult as not all countries adopted the same sampling methodologies.

Similar gaps appear in the ASEAN region. The most recent compilation of GERD statistics appears to date from 2011 (COST, 2015), indicating that with the exception of high-income Singapore, no member state achieves 1% of GDP as GERD. Malaysia stands at 0.6% and all other countries are around or below 0.2%. India's GERD as a percentage of GDP was 0.64% in 2020-21 (DST, 2023).

Improvements in the regularity and rigour of basic statistics relevant to R&I systems is an essential component of efforts to strengthen those systems. Without regularly collected and internationally comparable data, it is difficult to assess whether interventions are having a notable effect on systems strengthening.

However, as noted above in Section 4, developing strong R&I systems requires not only the allocation of government resources but a range of technical and institutional capabilities that enable the effective allocation of those resources to productive R&I activity. In the report on the innovation paradox noted above, the authors identify a requirement for governments to develop capabilities across four key dimensions:

1. **Policy design** requires the ability to identify market failures, design the appropriate policies to redress them, and establish clear metrics for success. Many failed

experiments in developing countries result from simply importing from advanced countries institutional models and best practices that may not address the true failures or be politically viable. Many agencies, such as public research institutions, lack a clearly defined mission and incentives that would align them with identified clients and goals and shield them from capture.

2. **Efficacy** of implementation requires strong public management practices, as well as processes for evaluating, adapting, and modifying or terminating policies when needed.
3. **Coherence of policy** across the NIS requires the ability to take an overview of the overall system and effectively coordinate across ministries and agencies. In practice, policy is often balkanized by the ministry or administrative level, and there is little alignment between the stated goals of policies and actual budgets and impact.
4. **Policy consistency and predictability** require systems that cultivate innovation policies and institutions over time, overcoming fluctuations in political economy and guaranteeing a predictable environment for long-run innovation investing. Instead, there is often limited national consensus on the importance of the innovation agenda and high-level political commitment, and policy is subject to weak backing and frequent reversals (Cirera & Maloney, 2017).

The African Union's Science, Technology and Innovation Strategy for Africa 2024 (STISA 2024), recognised significant capacity gaps in the development of ST&I policy for African nations. These include:

- Important aspects of STI policy development such as establishing comparable baseline data and Monitoring and Evaluation (M&E) are not budgeted for (and thus not resourced) in most member states.
- Most of the entities responsible for STI policy-making have operated in isolation from other policy agencies, with weak links not just to the private and education and research sectors, but also to African and international Policy Research Think Tanks. Not having easy access to empirical material and recent knowledge in STI policy-making and ignoring inter-sectoral linkages and policy mixes make their institutional outputs much less reliable.
- Many of the officials involved in or responsible for drafting policy documents do not have the necessary skills or training and have no experience in evidence-based policymaking. Moreover, in most countries, institutions responsible for STI policy do not have appropriate libraries or easy access to sources of the relevant information for policy-making purposes. Very limited evidence-based policy development takes place in Africa (STISA, 2014).

As noted in section 5, many countries in Africa and the ASEAN region have published ST&I strategies and/or policies. However, the existence of such documents does not necessarily demonstrate the existence of the capabilities to implement such strategies.

Some level of research and innovation expertise, or at least scientific literacy, is valuable across government, so that ministries of finance can appreciate the value of investing in R&I and politicians and government officials in other departments can engage with R&I activity, on the demand side by articulating their sectoral priorities and having the capacity to use the outcomes of R&I to deliver their portfolios

However, as noted above in Section 3, one of the most significant institutions in an R&I system to enable the effective implementation of a national ST&I strategy can be the science granting council (SGC) or research funding organisation (RFO). Such organisations can not only manage the administrative processes of allocating grant funding to R&I projects, but can serve as focal points for expertise in policy design and management practices, and can

promote policy coherence across the wider system. If such organisations can be constituted with some degree of independence from government, which is not always possible, they can also provide important policy consistency in the face of fluctuations in the wider political economy.

In considering the opportunities for strengthening SGCs in LMIC settings it is important to reflect on the two existing and potentially competing models for supporting SGC capacity. The first is the model, spearheaded by the Wellcome Trust, to establish an independent African-based entity to manage research and innovation funding on a continental scale: first through the AESA initiative within the African Academy of Sciences (AAS), and subsequently through the establishment of the Science for Africa Foundation (SFA). The central ambition of these initiatives was to shift the 'centre of gravity' in research policy decision-making and grant management from the Wellcome Trust's headquarters in London to Africa. It should not be assumed, however, that geographical relocation alone unproblematically addresses the challenges of strengthening LMIC R&I systems. As one author notes (though not explicitly in reference to AESA or SFA):

Simply changing the geographic locus of articulating research agendas but without unsettling the assumptions, definitions and power structures that condition how knowledge is created, shared and utilised is unlikely to offer a path towards equitable and sustainable research systems (Mormina & Istratii, 2021)

SFA is an independent organisation without formal connection to individual African governments, though it has partnership agreements with the African Union and the government of Kenya where its offices are located.

The other model is the IDRC-led SGCI, which works directly with individual governments and their national-level SGCs. The focus of donor-funded efforts in the SGCI is on project work to strengthen the organisational capacity of its member organisations; it does not channel the hundreds of millions of dollars in research funding that SFA is able to provide.

Though it is somewhat simplistic to do so, as the implementation of both programmes is complex, reflective and nuanced, the existence of these two models highlights a challenge and strategic choice which can confront emerging LMIC SGCs, which is whether they should adopt criteria for allocating research funds based on Northern models of 'research excellence', or more localised criteria for prioritisation:

If they choose to follow the traditional research excellence model...this could have the benefit of aligning them with powerful regional emerging actors such as AESA. It could also lead to ease of collaboration with regional and international academic partners and have implications for reputation amongst international science funding and policy actors. It could also align them to elements of their domestic scientific communities who are seeking to be recognised according to international metrics of excellence, and who are seeking to strengthen their position in international science and research networks. However, if this produces a funding system that is seen to be aloof from national priorities and in the end may fail to produce the promised economic payoffs within a timescale that governments expect, it could damage SGCs' ability to secure political support for stable and continued funding in the long term.

If SGCs adopt a strong version of embedded autonomy, where a range of conditions is put on funding to guide science towards national priorities and goals, this could also put them in a difficult position. It is clear from the literature and the findings of

our study that many in the scientific community in SSA receive relatively large amounts of funding from international sources. This means that scientists who have the reputations and ability to gain international funding and have an interest in maintaining their autonomy from government direction could (seek to) bypass emerging national-level SGCs and seek funding from the regional and international level if their interests do not align. (Chataway, et al., 2019)

The challenge therefore, is not simply to establish SGCs to manage R&I grants, but to empower them to navigate the complex power dynamics and potentially competing interests, both nationally and internationally, so that they can effectively set and implement R&I agendas that maximise the benefits of R&I investment to their societies.

It is also important to recognise, though this dimension often is neglected in the capacity-strengthening literature, that funding for R&I projects is only one route through which the R&I system is financed. Governments also provide core funding for universities that is not linked to specific projects. In LMIC contexts, it appears that this funding is normally calculated on simple metrics, such as numbers of students. In contrast, in HICs, university support is often allocated according to some form of assessment of institutional performance, known as a Performance-based Research Funding System (PRFS) (Debackere, et al., 2017). PRFS is now common across Europe, but most countries use systems that make more extensive use of quantitative metrics, whereas the UK system is based on peer review (Zacharewicz, et al., 2019).

Our review is yet to identify any LMIC countries which employ a comparable PRFS. The SRIA needs assessment reports identify numerous examples of project-based research funding at the national level but make no reference to performance-based institutional funding (Table 8).

Table 8: Summaries of national research funding models

Country	Research Funding Model
Ethiopia	Limited project-based funding for research allocated to individual researchers. Researchers required to publish one article every two years with 5 co-authors
Ghana	Funding for individual researchers through Research and Book Allowance scheme, unconnected to research production
Kenya	NACOSTI (National Council for Science and Technology) expects every institution to spend at least 2% of turnover on research, though even most research-intensive institutions only spend 1%
Nigeria	Funding disbursed by Tertiary Education Trust Fund, university financing does not appear to quality or performance related, though research grant funding also exists
Rwanda	Project funding from National Research and Innovation Fund, Higher Education Council funds universities but no indication of performance-based allocation

Country	Research Funding Model
Tanzania	Research projects funded through COSTECH, but no reference to performance-based allocation to research organisations
Uganda	Research projects funded through Uganda National Council for Science and Technology, strategic plan for National Council for Higher Education mentions evaluation, but provides no details

There are a wide range of indicators and assessment methods employed in various PRFS mechanisms. The introduction of a PRFS can be very disruptive. However, linking core university funding to a wider range of deliverables rather than just student enrolment could be a powerful lever to implement ST&I policy priorities. For example, it is often noted that one of the challenges for R&I delivery in Lower income countries is that university staff are burdened with onerous teaching loads and have no time to pursue research. In a context where university financing is linked to student numbers, this is hardly surprising.

8.2 FCDO's added value

The FCDO has long term partnerships with local governments in Africa and Asia, so it is well placed to engage in dialogue with national governments on needs assessments to continue to strengthen their R&I systems. Given that FCDO is a partner both on programmes implemented by SFA and the SGCI, it is well placed to facilitate discussions to ensure that the two major initiatives on the content to strengthen research grant funding capacity are aligned and complementary, and do not lead to tensions. With a substantial research budget of its own, the FCDO has the capability to ensure that its own research funding processes deliver capacity strengthening and support the strengthening of local systems.

The UK has a highly sophisticated and resource-intensive PFRS in the form of the Research Excellence Framework (REF). Conducted every 7-8 years, the REF primarily functions to allocate quality-related (QR) research funding to UK research organisations. It is largely based on an overall assessment of the quality of research outputs produced by individual university departments but has been adapted in each cycle to also highlight other dimensions of research value, including impact, equality and diversity, interdisciplinary research and institutional environments. The FCDO is therefore well-placed to share experience and expertise in exploring the implementation of some form of PRFS in LMIC contexts.

8.3 Potential interventions

The most substantial initiative to map national R&I systems identified by our work is UNESCO's Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN)²⁵. To date, it has published eleven R&I country maps (Kenya, Cambodia, Mozambique, Uzbekistan, Lao PDR, Guatemala, Israel, Rwanda, Zimbabwe, Malawi and Botswana). These maps are substantial documents, which go considerable distance to addressing the statistical gaps noted above for the countries in which they have been conducted. They also provide details of major research organisations, strategic priorities and relevant legislation and regulatory frameworks.

²⁵ [Global Observatory of Science, Technology and Innovation Policy Instruments \(GO-SPIN\) | UNESCO](#)

A detailed review of each of these substantial documents was outside the scope of the current project. It is unclear the extent to which they are used, either to inform the detailed design of capacity strengthening efforts or to assess the impact of such efforts on overall system strengthening.

A series of rapid needs assessments were conducted during the inception of the SRIA programme. These were conducted for seven countries (Ethiopia, Ghana, Kenya, Nigeria, Rwanda, Tanzania and Uganda) over an eight-month period from March to October 2019. Feedback from FCDO staff in interviews conducted for this report suggests that these needs assessments were of limited value, and their recommendations have not been systematically or exhaustively incorporated into the later programming of SRIA²⁶.

The SRIA needs assessments were conducted by a small team of northern-based consultants, using published sources and in-country interviews. The summary report acknowledges several limitations, specifically:

1. High-level overview
2. Lack of historical and sociological analysis
3. Porous boundaries between research and innovation systems
4. No consideration of research uptake
5. Limited data availability
6. Limited stakeholder engagement

To these we would add the observation that the needs assessments were conducted as a one-off exercise, without consideration to building an ongoing framework which could assess progress.

Despite the limitations of this previous work, as the ESSENCE initiative has recognised, the existence of a holistic picture of a R&I system's existing capacity is fundamental to both strategic decision-making on where to focus future interventions, and the ability to assess the effectiveness of such interventions.

Our second recommendation, therefore, is that FCDO engage with UNESCO to identify ways to support and strengthen to continuation of the GO-SPIN mechanism, increasing the number of countries mapped and ensuring mechanisms are implemented to enable the use of maps to inform coherent design and delivery of capacity strengthening interventions, and to evaluate their impact on R&I systems.

This process should be implemented in multiple countries so that it can be designed to be flexible enough to adapt to local contexts, but systematic enough to enable comparisons between countries. It should be locally-owned and led, and as inclusive as possible of the full-range of stakeholders with an interest in the R&I system (thus including the private sector, grassroots organisations, university students, etc.)

Ideally, this engagement will be done as part of the funder's forum established as our first recommendation, so that a common approach to utilising the maps was adopted by a wider range of capacity strengthening funders.

²⁶ Specifically, the synthesis report produced a summary of priority needs for the individual countries studied (Table 3: p. 37), but it does not appear that these priorities were specifically incorporated into the design of the subsequent portfolio for SRIA (this observation may change due to further interviews/document review)

Such an effort would be analogous to workstreams pursued by the ESSENCE network in health, specifically:

1. The WHO Global Observatory on Health Research and Development (R&D) is establishing, in collaboration with WHO regional offices and member state representatives, a set of core metrics to characterize the status of health research capacity at the institutional and national levels in a standardized way worldwide. In the interim, existing data from grants on health research, clinical trial registries, distribution of health researchers, and bibliometric analysis may be used to infer health research capacity levels.
2. World RePORT, an open-access, interactive database project that maps biomedical research investments and partnerships from some of the world's largest funding organizations of health research, which should be strengthened and serve as a key resource (Kilmarx, et al., 2020).

Recently, a small number of initiatives have been developed to improve the quality of ST&I policy making in Africa. For example, for SGCI, ACTS has produced a handbook/ training module on ST&I policy (Diyamett, Makundi & Sheikheldin, 2019). Such individual and organisational level training is vital to ensure the human and institutional capabilities exist to implement strategic plans. Continued support for such activities can be delivered as part of the portfolio of organisational support outlined in the next section.

Science Granting Councils Initiative is unique in providing support to national systems-level institutions. Its recent evaluation suggested that the SGCI has had a significant impact in strengthening its participating organisations, but there is still much more that could potentially be achieved (Sadeski, et al., 2023). The main recommendations of the evaluation are presented in **Box 2**. Two other important findings were reflected strongly in the evaluation but are not summarised in the recommendations. The first is that the potential for SGCs to facilitate public-private partnerships was highlighted as a major area of interest by the participating councils, so there is potential for the SGCI to strengthen wider innovation systems as much as research. The second is that participating councils found the opportunities to collaborate with each other in research funding emerged as a key, unanticipated outcome, as noted in the report:

...the key successes from the SGCs' perspective are undoubtedly the launching and management of research calls both independently and in cooperation with other Councils. Being given a more central role in the management of the entire process of a call, without the involvement of an external expert was a great achievement for participating Councils. Another success story closely linked to the latter is **the opportunity for the implementation of collaborative calls and the development of strategic partnerships among Councils.** This network approach seems to be particularly effective in strengthening the abilities and capacities of Councils... (ibid., p. 56)

While the SGCI has had considerable success in strengthening core capabilities of its member councils, such as the implementation of digital grants management systems, the level of funding for research projects managed through the councils is relatively limited. For example the African-Japan Collaborative Research on Environmental Science (AJ-CORE) initiative, implemented through the SGCI appears to have a total programme fund of less than the £400k²⁷, including the Japanese collaboration. An initiative with the German Research Foundation (DFG) funded three projects at a maximum of £65k each, and the Covid-19

²⁷ https://www.jst.go.jp/inter/english/program_e/announce_e/announce_aj-core_2nd.html

Africa Rapid Grant Fund had a total funding of approximately USD \$4.75 million, distributed among 74 projects, with only slightly over half of these being research projects, the others funding science engagement. These funding levels should be contrasted with the hundreds of millions of pounds channelled through the SFA Foundation. The SGCI evaluation notes:

The lack of funding to finance research appears to be common to all the participating countries and hinders their ability to either recruit or keep experienced staff also to attract high-calibre researchers to investigate issues that are relevant to the development priorities of the country. The resources allocated under the research call projects are not very attractive for experienced researchers who compete internationally, but they have the merit to pave the way for national research funding (ibid., p. 57)

Given the central importance of SGCs/RFOs to the functioning of an effective national R&I system, our third recommendation is that the successor programme should continue to support the SGCI, and enhance this through major investments in multilateral research programmes to address R&I priorities identified by the African SGCs.

Major research programme funding to the SGCs could have a range of spillover benefits. First, the funding could be matched to government contributions (though potentially at greater than 100%, with possibly a greater match offered to lower-resource countries). This could incentivise local R&I funding. Second, substantial investment by FCDO could crowd - in additional support, encourage other funders to increase their levels of funding channelled through SGCs. Third, the management of major research programmes could significantly enhance the profile of the SGCs.

One of the recurring challenges of international funding schemes, where national funding agencies support the participation of research institutions in their country in multinational collaborations, is that the funding levels available in each country are unlikely to map onto the funding needed to support the strongest projects. Countries can find themselves unable to support good quality projects which they have the financing for because others have run out of funds to support the collaboration on those projects from other countries. In the experience of the author of this report, this was a constant challenge for collaborative funding among European countries. Therefore, in addition to directly matching national contributions, FCDO could provide flexible top-up funding to SGCs as needed to ensure the strongest international collaborations could be funded. Such a mechanism would substantially enhance the effectiveness and efficiency of multilateral funding programmes.

We recognise that FCDO is prohibited from providing funds directly to LMIC governments, which could impede its ability to support major programmes through the SGCs. One way to address this may be to work with the SFA to manage funds and award institutional grants. This would have the further benefit of supporting greater cooperative working between the SFA and individual national SGCs.

Beyond this, FCDO should also consider how it might transfer more of its wider research budget to being managed by LMIC institutions. FCDO's Research and Evidence Division disburses a substantial budget for research activity, much of it to northern-led research programme consortia. FCDO research programme specification often specific countries within which research should be conducted, and while an emphasis is placed on building equitable partnerships with local researchers, it is not clear externally how such programmes engage with the full range of stakeholders

Box 2: Recommendations of the SGCI Evaluation (Sadeski, et al. 2023)

1. International partners should initiate a follow-up phase to the SGCI beyond 2025 (SGCI 3), to extend the funding available for African SGCs, so that Councils can continue their transformational journeys
2. Science Granting Councils should fully own and invest in their transformational journeys to ensure these are sustainable
3. The Initiative should, as much as possible, provide training tailored to the few key priorities of Councils and accelerate the uptake of associated knowledge outputs
4. Science Granting Councils should take a more proactive stance on gender and inclusivity in order to ensure further mainstreaming of these aspects in their work
5. The SGCI Monitoring, Evaluation and Learning framework should be developed at the level of each Council level in order to capture the progress each Council is making on their transformational pathway

As noted above, PRFS have the potential to provide LMIC governments with powerful new levers to implement strategic R&I agendas, by providing clear financial incentives for institutions to deliver on strategic priorities. However, the introduction of PRFS mechanisms may be disruptive to existing systems and may be politically complex and challenging. Nevertheless, it is worth pursuing some exploratory work to determine the appetite for PRFS among partner governments. The SGCs would be one obvious starting point for such discussions.

Our fourth recommendation is that FCDO do some exploratory work to assess interest in the development of PRFS. If such interest exists, they should commission local consultations among key stakeholders to assess the feasibility, benefits and risks to countries of developing PRFS.

This work could be conducted in the first years of the successor programme. If the results of an initial feasibility study are positive, this could evolve into a more substantial component of the programme in later years.

8.3.1 Institutional IP policy and training support to commercialising innovation.

Protecting R&I intellectual property outputs is an essential step in progressing projects through the commercialisation stage where they can turn into new products, services or methodologies to benefit the wider community. However, understanding what outputs can be protected, which should be prioritised and what type of IP protection is best suited for each project required technology transfer professionals and inventors to have an in-depth understanding of IP principles and tools that are contextualised for their local market.

The issue of underdeveloped IP policies and commercialisation routes in Africa was brought up by at least two of the stakeholders interviewed. While strategic IP support and capacity building is not an area that FCDO has actively pursued in the past, there is an opportunity to partner with organisations, such as WIPO, that specialise in IP and have LMIC expertise to add value to the target countries. As part of the partnership, FCDO could provide the SGCs or other institutions in need of IP capacity building with access to the WIPO services or collaborate to co-create a more targeted programme for institutions in receipt of FCDO R&I grants.

WIPO's most significant LMIC systems-level intervention is the Technology and Innovation Support Center (TISC) program, which established centres for IP and technology transfer support across 90 countries, usually hosted at leading universities and research institutes within the countries.²⁸ Among the TISC's programme activities in 2022 (in selected FCDO target geographies) are:

- provision of IP training for students and researchers and delivery of over 900 patent searches in Mongolia
- development of >30 IP rights organisations who manage and oversee the creation, protection, and commercialisation of intellectual property (IP) in India
- IP training, commercialisation and patent drafting support in Ethiopia
- IP awareness workshops for 50 participants in Nigeria

The TISC programme also offers its members access to digital platforms to search for patents and publications and share knowledge (see the eTISC platform).

Given WIPO's extensive track record in this field (TISC has been running since 2014) across both Africa and Asia, we believe they would be a valuable partner in tackling systems-level capacity building in the IP field, as part of the wider FCDO successor programme. FCDO could partner with WIPO in the successor programme through a variety of approaches:

- Partnering with WIPO to deliver IP training and technology transfer support to Universities and Research Institutes in receipt of grant funding
- Co-developing an IP training programme focused on local strategic areas, e.g. telecommunications, agriculture
- Co-develop a capacity building programme targeted at SMEs and/or researchers and entrepreneurs based outside of academic institutions (SMEs are becoming a strategic target for WIPO)

Another opportunity for an FCDO-WIPO collaboration, as highlighted by the WIPO Head of Technology transfer during an interview, was the Enabling Innovation Environment (EIE) Project for IP and Technology for which a second iteration is under development. The programme brings together a regional cluster of innovation and research ecosystems from low and middle-income countries to create a local mass of IP experts. The programme aims to make the knowledge transfer on IP more efficient within the cluster where there is an assumed socio-cultural alignment and shared challenges. FCDO's role in this context could be to convene local stakeholders to engage and take action on shared IP challenges, but a subsequent discussion with WIPO is needed to understand how the two organisations could best work together towards the shared goal of strengthening innovation and research systems.

8.3.2 Attracting private funding

At this stage of R&I ecosystem strengthening, interventions specifically focused on attracting private investment are potentially premature. We suggest that FCDO consider an intervention focused on connecting venture capital and other private investor with the R&I ecosystems in the second iteration of the successor programme. There are few examples of good practice where government funders have applied themselves to this stage of innovation commercialisation. A UK-based example, which could be replicated in an LMIC context, is *The investment accelerator pilot* run by Innovate UK in 2017. This project provided UK businesses with grant funding and matched VC investment from selected VC

²⁸ <https://www.wipo.int/tisc/en/>

partners to develop projects in key strategic areas. The programme aimed to de-risk early-stage projects for further private investment.

Potential ways to work with VCs as part of the successor programme could include:

- Offering VCs and private investors seats on a national/international SGC steering committee
- Directly or through international delivery partners: building the capacity and skill set of LMIC private investors through international training and networking programmes that can facilitate UK-LMIC shared learnings. An example of this is [Accelerating Growth in Africa: Top African Venture Capital Fund Managers Unite in Oxford](#), delivered by the University of Oxford's Saïd Business School.

8.3.3 Building the government agencies' capacity to engage with the Innovation ecosystem

One relatively untapped opportunity to create an enabling environment for R&I in LMIC is to support the establishment of a government innovation procurement mechanism. There is an opportunity to build on the UK's knowledge of such interventions to support LMIC governments to become early adopters of innovation and thus set a positive precedent for the local market. Examples of successful initiatives include:

- **UK:** [CivTech](#) Accelerator in Scotland, which brings together blue-chip public sector organisations to act as 'Challenge sponsors' with individuals and companies to co-create innovative solutions to create a Minimum Viable Product to address specific challenges.
- **UK:** [Public.io's](#) accelerator programme that fosters the creation of partnerships between the UK government departments and companies with a technology innovation with the aim of streamlining the adoption of new digital tools and systems within the government.
- **UK:** the [Open Innovation Team](#) is a cross-governmental body that works closely with University researchers to bridge the gap between academic research and evidence-based policy. This approach includes offering policy masterclasses to researchers and funding fellowships for civil servants to collaborate with leading policy research institutions to collaborate on a specific challenge.
- **Africa LMICs:** Mastercard's [Centre for Innovative Teaching and Learning](#) (covered in more detail in the benchmarking analysis) brings together EdTech entrepreneurs, policymakers, researchers and government organisations to develop and implement EdTech innovation and share best practices in this sector. The Centre takes a challenge-based approach, where innovation projects are selected to receive support and test their solutions with government organisations.

By funding projects and interventions that address the need for better, more efficient government procurement in LMICs, the FCDO successor programme could lead to:

- Improved public service delivery for local governments by leveraging the latest innovations and tools, e.g. digital platforms
- Shorter route-to-market, increased business growth and commercial opportunities for entrepreneurs and innovative businesses targeting the public sector
- Increased knowledge exchange between the local government and innovation stakeholders
- A mechanism to streamline the policy-to-research-to-innovation-to-policy process

Our recommendation, based on preliminary feedback from workshops with FCDO stakeholders, is for this new intervention to be trialled first at a local level within the African context, potentially hosted by an organisation such as [INGSA](#), after which an expansion to ASEAN geographies to be considered.

8.3.4 Supporting the development of a catapult-like international network in LMIC

In the UK, the implementation of the independent, not-for-profit Catapult Network which provides specialist R&D infrastructure and assistance, is a unique capacity-building intervention that bridges the gap between research and commercial ventures. The Network of 9 specialised R&I hubs bring together universities, government organisations, start-ups and established industry partners to work on R&I projects that play a role in boosting the local economy, as well as UK's R&I performance as a whole. Combining grant and other government funding with commercial income, the Catapult Network has been instrumental in supporting over 11,000 small and medium-sized enterprises (SME) and running and facilitating more than 5,500 academic partnerships since launch.

Implementing a similar approach in LMIC should be strongly considered in the medium and long term because it has the potential to lead to:

- Increased commercialisation of innovation and research from all sectors of the ecosystem, such as grassroots researchers, SMEs, charities and other organisations with limited internal commercialisation capacity.
- Harmonised commercialisation opportunities for researchers and entrepreneurs within the target implementation countries
- Establishment of a new mechanism to engage other donors in supporting the R&I ecosystems
- This activity will also contribute to achieving a sustainable impact and a more resilient ecosystem by ensuring countries have strong intrinsic commercialisation capabilities
- Creation of new jobs in the R&I sector and beyond

One key aspect that makes the Catapult Network a promising approach for LMIC, is the key role they have played in accelerating and bringing to market innovation projects at mid to late technology levels (TRL 4-7), which are conventionally the riskiest development stages for new products and services. Having a similar network of innovation hubs in the LMIC context could pave the way for better research and industry engagement, as well as bring more innovations to the stage where local and international private funders (e.g. VCs and CVCs) are prepared to invest significantly in the ventures pursuing these innovations.

Another important feature of the Catapult Network is that its hubs and centres are well-embedded in the local R&I ecosystem and draw from local research and development strengths in target sectors. In an LMIC context, a Catapult Network can be built around a range of sector specialisms that are in line with the country's STI strategy.

The funding of an inter-Africa or ASEAN Catapult Network is likely going to need coordination with other international funders and local governments, but the FCDO is uniquely positioned to lead this initiative, given the UK's expertise in implementing such a network, and the FCDO's convening power among partner LMIC organisations, well as the private sector.

Another possibility is to develop the network by building on existing R&D hub infrastructure.

Drawing from the benchmarking analysis in Section 5, we observed that the UNDP's Labs are similar to this intervention but focus mostly on individual entrepreneurs and SMEs. The advantage of a collaboration with the UNDP Labs is their excellent coverage of LMICs across the world, while their drawback is the lack of systems-level impact reported. The latter is likely due to a focus on smaller projects rather than engaging all ecosystem actors in the priority areas ('challenge sectors'). What the UNDP Labs initiative shows is that the network is a valuable instrument for Country Agencies like JICA to co-fund in view of UNDP's Japan - LMIC developmental partnerships.

9 Strategic challenge 3: Strengthening the capacity of research and innovation organisations (Stage II)

9.1 Problem description

So far, this report has mainly focused on the core organisations and instruments delivering research capacity: funders, central governments, science granting councils and research organisations. There is also a much wider range of organisations which contribute to the functioning of an R&I system and operate at national or international levels. These include academies of science and other learned societies, consultancies, independent think tanks, professional associations, chambers of commerce, knowledge intermediaries and NGOs. Included in this category we can also include the broader set of management and technical capacities that are needed in research organisations to create an enabling environment for research and innovation. Particularly important among these are the components such as tech transfer offices which promote collaboration between research organisations and the private sector. As well as promoting and pursuing their specific interests and remits, all these types of organisations, to a greater or lesser degree, can function as boundary managers, as noted in the discussion of SGCs above, by strengthening the interconnections between various components of the R&I system.

Numerous organisations exist in Lower-income countries that are committed to research and/or innovation capacity strengthening. For example, the Partnership for African Social and Governance Research (PASGR), manages several programmes to strengthen linkages between research and policy through investment in research, postgraduate training and professional development²⁹. The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is a network of 170 universities in 40 countries ‘to strengthen the capacities of universities to foster innovations responsive to the demands of small-holder farmers through the training of high-quality researchers, the output of impact-oriented research and the maintenance of collaborative working relations among researchers, farmers, national agricultural research institutions and governments.’³⁰ The African Research Universities Alliance is a network of 23 African universities dedicated to pooling resources for ‘expanding and enhancing significantly the quality of research done in Africa by African researchers.’³¹ The Network of African Science Academies (NASAC) ‘brings together 28 merit-based academies of science in the continent to discuss the scientific aspects of problems of common concern, to make common statements on major issues relevant to Africa and to provide mutual support to member academies.’ The South African Research and Innovation Management Association (SARIMA), East African Research Management Association (EARIMA) and West African Research and Innovation Management Association (WARIMA) all work to promote best practice for R&I management in their respective regions.

³²

It is increasingly recognised that organisational capacity strengthening is essential to the delivery of effective research collaborations, especially when considering north-south

²⁹ [PASGR - Advancing research excellence for governance and public policy in Africa.](#)

³⁰ [Mission Vision Goal | RUFORUM](#)

³¹ <https://arua.org.za/wp-content/uploads/ARUA-Concept.pdf>

³² <https://www.interacademies.org/organization/network-african-science-academies-nasac>

partnerships. A recent guidance document notes that, *'not all institutions or researchers have access to the same kinds of infrastructure and facilities, funding, administrative support, communication skills, opportunities for public engagement or career and professional development'* and that this can *'present real obstacles to the equitable allocation of research opportunities'* (ESSENCE, 2023).

For example, one important area for strengthening is the expertise and structures required for conducting an ethics review of research. Particularly in health research, standards for ethical approval are largely driven by HIC contexts and built around the primacy of randomised controlled trials (RCTs). However, as the Global Forum on Bioethics in Research (GfBR) noted:

Ideally, novel designs and methods should be given equal consideration to traditional models. However, the required infrastructure is lacking, especially in Low-income countries. Capacity development is urgently required to build the necessary skills to consider, review and implement these designs and methods (Hunt, Saenz & Littler, 2019)

Given the more established nature of capacity strengthening in health compared to other sectors, it seems very likely that ethics review capacity is also urgently needed in other sectors.

The lack of organisational capacity in research organisations appears to be a major source of inequality not just between northern and southern organisations, but between ROs in the south. In Africa, a small number of organisations have historically been recipients of sizable research investments from international donors, which has created capacity gaps between these and other organisations. The hub and spoke model implemented by the DELTAS programme is one example of an effort to address this.

The knowledge base for effective organisational-level capacity strengthening is still developing. For example, *'published, valid and robust indicators for measuring many aspects of RCS (research capacity strengthening) are scarce, and data tend to be more descriptive than quantitative. This makes the evaluation and selection of RCS proposals difficult and complex'* (ESSENCE, 2023).

A systematic review in 2020 which aimed to identify LMIC research capacity-strengthening interventions at the organisational or systemic level identified only 19 papers related to 14 interventions (Vicente-Crespo, et. al., 2020). None of these papers reported results systematically, nor did they connect inputs to outcomes through clear conceptual frameworks. The authors also noted that they were unable to identify reports from any interventions outside of the health research sector.

Another review, published a year earlier, focused on the management of health research capacity strengthening (HRCS) consortia and concluded that *'the evidence base to inform HRCS implementation is weak, and HCRS consortium actors lack the theoretical and empirical bases for framing their practice'* (Tagoe, et al., 2019)

9.2 FCDO's added value

The FCDO has an established mechanism for funding organisational level projects through the RISA Fund which addresses both the research and innovation spheres by combining the implementation of the SRIA and ATIP programmes.

Given the overall low-levels of evidence for the effectiveness of organisational-level interventions, the FCDO's expertise and commitment to quality programme evaluation (through, for example, the EQUALS system), combined with its understanding of learning and adaptation in programme implementation, make it well-qualified to support a programme that will foster learning about 'what works' in organisational level strengthening while implementing a project portfolio.

Furthermore, FCDO is well-positioned to facilitate collaborations between LMIC organisations and comparable institutions in the UK where there is demand. This could include the Royal Society, British Academy, Innovate UK, and Russell Group.

9.3 Potential interventions

The RISA fund was met with exceptionally high demand, attracting 465 eligible applications for its open call in 2022. This suggests that there is an enormous appetite for the type of project funding that RISA offered. Awards were made to a broad range of organisations which included universities, private sector companies and NGOs. Interviewees did note, however, that the capacity of funded organisations to manage their awards did vary considerably. As this portfolio is still in implementation, this report should be read and considered in conjunction with the outcomes of the evaluation being conducted simultaneously.

The RISA fund took a geographically- and sectorally-broad approach to funding research and innovation system strengthening projects. According to an interviewee, the drawback of this approach was to dilute to potential for projects to achieve a cumulative impact on a research and innovation system. However, the advantage is that a broad portfolio provides more opportunities for experimentation and innovation in how, when and where capacity-strengthening interventions are delivered.

Given this, as part of wider portfolio, ***our fifth recommendation is for FCDO to continue to fund a broad range of organisational interventions, continuing the current investment strategy of the RISA fund.*** In doing so, however, the outcome focus for the portfolio should be on enhancing learning on the practice of R&I capacity strengthening, as much as the direct strengthening of R&I systems and organisations. Multiple rounds of funding calls should be planned, with adequate resourcing to ensure lessons are learned and implemented in subsequent rounds.

Support for capacity strengthening projects could therefore produce three types of outcomes, and the monitoring of the fund should seek to capture each of these:

1. The direct contribution to system strengthening achieved by the project
2. The capacities strengthened within the organisation(s) conducting the project
3. The wider lessons learned from the delivery of the project

A substantial range of different projects could be supported through this portfolio, and innovation and experimentation should be encouraged. Alongside this, however, we recommend that the processes for assessing applications to the fund be strengthened and made more transparent. An independent panel of experts in R&I management should be convened to make funding discussions according to clear and published assessment criteria. All applicants should be provided with detailed feedback on their proposals with suggestions on how they could be strengthened for unsuccessful applicants.

The programme should include significant opportunities for networking between projects engaged in similar activities, to enable them to share learning and identify opportunities for collaboration if appropriate.

To enhance the depth of the fund's impact, as well as possibly managing demand, the FCDO should consider carefully an appropriate balance between an open call, inviting submissions for a wide range of initiatives related to organisational and systemic strengthening, and more targeted calls. Call themes could be structured around strategic priorities for R&I, such as agriculture, digital innovation or climate change resilience, or alternatively, they could be focused on particular aspects of system strengthening, such as tech transfer, public engagement, effective policy advice, or data access.

Northern institutions should be eligible to participate in projects where there is demand for this from LMIC project leadership and where this is structured around the principles of equitable partnership. This could include technical assistance, training or staff exchange programmes. We recommend that the Fund should exclude health-related projects, at least initially. While there is not a direct analogue to the RISA fund directly in health, given the broader gap between support for health research systems strengthening and other sectors, there is a risk that health-related projects would crowd out other sectors. Other funders are likely to have the capacity to support RISA-type investment in the health sector should the programme demonstrate success.

9.3.1 Supporting late-stage innovation through expanding the open innovation programmes with UK KTN

The [Knowledge Transfer Network Global Alliance Africa](#) (KTN GAA) – co-funded with Innovate UK is an example of a successful intervention as part of the ATIP programme, and later on ran under the RISA fund, which has helped create a network of partnerships between local governments, start-ups, entrepreneurs and large industry players, impacting the R&I systems at multiple levels. The initiative has also helped mobilise further funding from partners (particularly private-sector partners) who decided to support further iterations and overall has showcased a new approach for supporting late-stage innovation in LMIC.

An important component of the intervention is the Open Innovation programme (OI), which connects 'challenge holders' (large companies or governments looking for new technologies and services to address a key business challenge) and the 'solution providers' (start-ups and small companies), while also offering seed funding and business support to the solution providers. This work has been highlighted as a particular example of success in strengthening ecosystems at the systems level during stage I of key informant interviews. The KTN and FCDO leads were able to design specific programs and interventions collaboratively with partner countries and thus focus on their key needs for economic development while capitalising on the UK's knowledge of having validated the methodology for such open innovation programmes. In addition to the funding, the OI programmes brought valuable know-how in running sector-specific challenge-led innovation programmes.

One major challenge for the programme that was mentioned during the stage I interviews was the gaps in the systems-level commercialisation enabling environments, an example of which is the challenging IP environment in certain African geographies where the absence of good IP practice and practical IP models for commercialisation can hinder the development of new products and services. Thus there is a potential to maximise the benefit of the successor programme by running OI-type interventions in parallel and in close collaboration with other systems-strengthening interventions, such as those mentioned in section 8.3.

One approach to building on the OI programme in the successor programme is to expand this approach to the ASEAN context and explore connecting 'challenge holders' and 'solution providers' across the Asia-Africa R&I ecosystems based on shared economic challenges. The OI model can also be modified to act as a South-South partnership brokering tool (similar to the), as well as a knowledge repository on 'what works' in R&I public-private, private-private and public-public partnerships. The platform can thus also act as a repository of evidence base of interventions and their impact across Asia and Africa LMICs to inform policy improvement in R&I systems strengthening. The [South-South Galaxy](#) (covered in the benchmarking analysis) is a great example of a knowledge repository approach to economic capacity building, though it does not specifically focus on R&I strengthening, and instead, it has a wider focus on economic development. Funding-wise, bringing large industry partners on board as funders can be an effective way to ensure the sustainability of programmes and FCDO seems to be one of the few international funders in this space that has the flexibility to engage meaningfully with the private sector.

10 Summary of Forward Looking Key Informant Interviews

To validate the findings of the literature review and benchmarking analysis and identify any gaps, specifically contextualised to the Asia context, Oxentia and OPM have conducted an additional five interviews focused on gathering insights from ASEAN stakeholders and those who run programmes in ASEAN countries, Section 10 summarises the insights from the five interviews conducted with key stakeholders working in the R&I sector in Southeast Asian Countries. The interviews aimed to test the three key intended outcomes and pathways to impact identified in the co-developed Theory of Change, as summarised below and outlined in Table 9:

1. FCDO acting at a global level to ensure the international R&I funding community provides strategically coherent and effective support to R&I systems in lower-income countries
Results in: decreased donor fragmentation, better coordination of funds towards strategic goals
2. FCDO acting more directly across a set of focus countries, to support governments to design and deliver effective R&I strategies and monitor their implementation
Results in: interventions that align to national priorities; capacity being built at a local and national level to monitor and evaluate interventions.
3. FCDO acting more directly across the same set of focus countries, to support quasi-government and non-government R&I organisations to ensure they have the capacities, resources and interconnections needed to deliver national R&I agendas; our suggestion is for this to combine top-down larger-scale strategies with more open bottom-up project calls.
Results in: high levels of communication and collaboration among ecosystem

The key questions and topics explored during the interviews are outlined in Table 10.

The following sections summarise the key takeaways of the ASEAN informants' interviews and, separately, in light of its specific scope and role in the ecosystem(s), of the WIPO interview.

Table 9 ToC summary of activities and associated outputs and key outcomes

Activities	No	Outputs	Key Outcomes
At a global level, establish and manage a secretariat for R&ICS*** funders forum	1.1	Shared knowledge base of best practices informed by consistent Monitoring & Evaluation practices	The International R&I funding community provides strategically coherent and effective support to lower-income countries' R&I systems
	1.2	Common policy frameworks to support research capacity strengthening	
	1.3	Established collaboration with UNESCO to support the GO-Spin initiative of mapping R&I ecosystems to better understand local challenges	
	1.4	Established collaboration with WIPO's TISC programme to build technology transfer and IP capacity within the research ecosystems and bridge the gap between research and innovation	

Support training and technical assistance to lower-income country governments on the development of R&I policy	2.1	R&I System mapping, which could rely on GO-Spin but could be supplemented, and should include capacity assessments that enable measurement of progress	Lower-income countries' national governments can design and deliver effective R&I strategies and monitor their implementation
	2.2	More skilled R&I policymakers	
	2.3	Public procurement systems foster the scaling of local innovations	
	2.4	PRFS* was developed to provide additional mechanisms to finance R&I strategies	
	2.5.	Local Academies of Science are supported to conduct policy impact activities and other activities which strengthen collaboration	
Support further development of SGCs** in Africa, including through matched funding for major new programmes	3.1	SGCs strengthened to better manage national R&I investments and collaborate internationally	R&I organisations have the capacities, resources and interconnections needed to deliver national R&I agendas
Establish an analogous organisation to SGCI in SE Asia	3.2	Diverse organisations within R&I systems develop improved capacities to both conduct R&I and collaborate with other organisations	
Fund organisational-level capacity-strengthening projects through a commissioned portfolio that includes both strategic and open calls	3.3	R&I programmes generate direct outputs which contribute to development outcomes	
	3.4	A local Catapult-like network is established, with a range of sector specialisms that are in line with the implementation country's market need and innovation and research strategy (e.g. through establishing a new network of catapult organisations across Asia and Africa or by building on already existing UK catapult work at the international level)	
	3.5	The OI model used with KTN is modified to act as a South-South partnership brokering tool, as well as a knowledge repository on 'what works' in R&I public-private, private-private and public-public partnerships.	
	3.6	The local venture capital ecosystems is more engaged with the R&I ecosystem, e.g. by offering VCs and private investors seats on a national/international SGC steering committee or building the capacity and skill set of LMIC private investors through international training and networking programmes that can facilitate UK-LMIC shared learnings	

Table 10: Summary of interview questions

Question no.	Question description
1.	<p>Whether, in your view, the successor programme proposed activities and outputs seem likely to address systems-level capacity building needs <u>in your country</u> and whether a programme designed along such principles is likely to lead to a sustainable impact.</p> <ul style="list-style-type: none"> • <i>A successful outcome from the point of view of impact sustainability is one in which the programme activities continue to take place and generate outputs and impact even once the FCDO funding has ceased, e.g. by matched funding from local governments and /or private sector players etc.</i>
2.	If you answered 'no', then what should change? Do you have recommendations for other activities or outputs that the programme should pursue?
3.	If you answered 'yes', then who are the key programme partners in your country that should be engaged?
4.	Are you aware of other examples of activities or outputs that have helped or could help strengthen the R&I ecosystem in your country?
5.	Are the proposed outputs aligned with your short and long-term priorities?
6.	<p>In your view, is it feasible to target both the research stakeholders and systems (e.g. Universities, funders etc) and the innovation (entrepreneurs, start-ups, companies, investors etc.) stakeholders and systems as part of one R&I ecosystem? What are the relative pros and cons of this approach for a multi-country programme?</p> <ul style="list-style-type: none"> • <i>If the R&I systems in your geography are well inter-connected you may consider this a good approach. If in contrast, the R&I systems are distinct and do not interact much, it could be better to address the two through separate programmes.</i>

Table 11 Key informant stakeholders engaged in interviews, roles in the national ecosystems, and a short summary of the main challenges and priorities they have identified in their respective ecosystems

Stakeholder	Country	Role in the R&I ecosystem	Short summary of the main challenges and priorities discussed
World Intellectual Property Organisation (WIPO)	Worldwide	International funder – Intellectual Property and Technology Transfer	<p>WIPO focuses on partnerships around IP creation and protection, hence there must be a strategic alignment around funding R&I to establish mechanisms and infrastructures to create new IP. Traditionally WIPO partners with local IP offices, however long-term strategy is to engage with national funders, innovation agencies and ministries.</p> <p>Two tiers approach: train the trainer programmes for professionals in those ASEAN countries where there is an already existing infrastructure and innovation policies are in place (e.g. Singapore, Thailand, Philippines, Vietnam). Subsequently, they are in a position to train and help countries in the same region developing their innovation infrastructure and capacity.</p>
Mranti	Malaysia	Research & Innovation Commercialisation Agency	<p>Malaysia has multiple agencies and ministries involved in R&I, leading to potential overlaps and inefficiencies. Effective collaboration among these agencies can be challenging due to different mandates, priorities, and resource constraints. While Malaysia already has established R&I policies and strategies, building robust evaluation systems</p>

			to measure the effectiveness of R&I policies and programs may require additional investments. Furthermore, a centralised database containing comprehensive data on patents, research and technology in Malaysia is necessary.
VinU	Vietnam	University	Vietnam's research and innovation ecosystem faces significant fragmentation, particularly in the transition from research to marketable innovations. There is a lack of cohesive policies that connect public and private research efforts and a need for mechanisms that support the commercialisation of research
NSTDA	Thailand	Government Agency	Bureaucracy and regulatory challenges are significant obstacles, where policies do not always align with implementation needs. There is a need for more flexible and supportive regulatory frameworks that facilitate innovation and commercialisation
Misti	Cambodia	Government Agency	There is a strong emphasis on the need for capacity building, particularly in integrating science, technology, and innovation within the private sector. The creation of a National Research Fund is seen as a critical step towards building a more cohesive and effective R&I ecosystem, currently driven by different donors' priorities rather than a clear and shared roadmap

The interviews underscore the importance of addressing fragmentation, building institutional capacity, enhancing industry-university linkages, and creating supportive policy environments across Cambodia, Vietnam, Thailand, and Malaysia. These themes highlight the need for targeted interventions that are sensitive to the local context. The difference in maturity of the ASEAN ecosystems reinforces in fact the importance of avoiding a one-size-fits-all model in favour of a multi-intervention approach. For example, in some countries, capacity building, particularly in integrating science, technology, and innovation within the private sector, is a key challenge, while in others building stronger institutional frameworks is a priority.

Informants confirmed the perception that FCDO enjoys a special position in terms of convening power and networks. By bringing together different international funders and partners, FCDO is seen as well-placed to address funders' fragmentation and lack of coordination in the implementation of an R&I agenda. FCDO's convening power would help build more cohesive and effective R&I ecosystems, which would enhance the enabling function of national governments for the creation of stronger linkages between academia and industry, and, subsequently, for the involvement of other organisations which could contribute to the functioning of an R&I system (e.g., NGOs, VCs, corporates)

10.1 Potential partners

Informants listed potential in-country relevant government and non-government R&I organisations that could be suitable as delivery partners for the FCDO successor programme. The table below (Table 12) lists the potential partners suggested by key ASEAN informants divided by countries and functions in the R&I national ecosystems.

Table 12 Potential in-country delivery partners for the successor programme

Country	Suggested potential in-country partners for the successor programme	Function in the ecosystem
Malaysia	The Malaysian Industry Group High Technology (MIGHT)	Innovation
	ASEAN Technology Management Hub (TMH)	Innovation
Vietnam	National Foundation for Science and Technology Development (NAFOSTED)	Innovation
	National Agency for Technology Entrepreneurship and Commercialization (NATEC)	Innovation
	Vietnam Network of Higher Education for Entrepreneurship and Innovation (VHEI)	Research/Innovation
	Vingroup Innovation Foundation (VinIF)	Innovation
Thailand	Thailand Science Research and Innovation (TSRI),	Research/Innovation
	The Office of the National Economic and Social Development Council (NESDC)	Policy
	Ministry of Higher Education, Science, Research, and Innovation (MHESI)	Research/Industry connections
	The Office of National Higher Education Science Research and Innovation Policy Council (NXPO)	Research/Policy
Cambodia	The Ministry of Education, Youth, and Sports	Research

10.2 Similar programmes

Informants have listed similar programmes focusing on strengthening R&I systems. Table 13 below outlines some examples of similar programmes that could help strengthen the ASEAN ecosystems, the sponsor country and the sector (innovation or research). Most of the suggested programmes focus on innovation

Table 13 Programmes suggested by ASEAN informants that could help strengthen local ecosystems

Country	Similar programmes that could strengthen R&I ecosystems	Sponsor Country	Sector
WIPO	TISC Network	N/A	Innovation & Research
	Enabling Innovation Environment program EIE	WIPO sponsoring countries (various)	Innovation
Malaysia	National Innovation & Technology Sandbox NTIS	Malaysia	Innovation
	MySTI	Malaysia	Innovation

Country	Similar programmes that could strengthen R&I ecosystems	Sponsor Country	Sector
	Malaysia's Single Window For The Startup Ecosystem	Malaysia	Innovation
	MATCH platform	Malaysia	Innovation
Vietnam	Temasek Foundation – Net zero challenges	Singapore	Innovation
	Partnering for Green Growth and the Global Goals 2030 (P4G)	South Korea	Innovation
Thailand	I-Corps	USA	Innovation
	TIPS	South Korea	Innovation
Cambodia			

Recommendation: Partnering with WIPO for the co-design and delivery of [EIE programme](#) could be a quick win in the area of IP system strengthening for the successor programme. A short-length project could complement longer interventions in FCDO portfolio. WIPO aims to create a critical mass of local experts who can provide regional support to neighbouring countries. WIPO is currently looking into designing the next iteration of the EIE programme and aims to launch it in 2025.

WIPO's priorities:

- Create an environment where there is respect for IP in a sustainable way. At the national level, this implies having policies that facilitate IP creation and protection. At the international level, this implies having the funding, and infrastructure to create high-quality research
- Create an enabling environment not just for the protection but also for the utilisation and dissemination of IPs (especially for universities and the creation of spinouts)
- Alignment with UN SDGs

11 Conclusions

Overall, this report recommends FCDO take an approach to R&I system strengthening that is focused on interventions at the systemic and organisational level. This includes efforts to influence the international funding landscape for R&I investments and close collaboration with national governments to alter the overarching policy environment and strategic decision-making related to R&I. There already exist numerous interventions which solely target individual-level capacity-strengthening in both research and innovation. FCDO programming in this space would not take advantage of FCDO's unique strengths and capabilities.

Clearly it makes sense to support the strongest international programmes supporting R&I Systems. Given the variation in conditions and systems on both the research and innovation side it makes sense too for FCDO to 'fill in the gaps' at the national level based on a clear mapping and analysis of conditions in focus countries.

Our recommendations include a combination of continuing and enhancing existing interventions, such as project-level support for organisational capacity strengthening currently delivered through the RISA fund and participation in the IDRC-led SGCI, along with new interventions, such as the establishment of a global funders forum and matched funding for substantial R&I programmes designed and delivered by consortiums of SGCs.

An obvious area for expansion would be to seek to adapt successful programme designs from the African context to Southeast Asia, such as the DELTAS initiative and the SGCI.

For the purpose of the business case, one option would be to focus solely on continuing existing programme designs, with expansions into SE Asia and a broadening of the sectoral scope of programmes such as DELTAS. This would be a less risky approach and would enable FCDO to focus on continuing to learn lessons from the outcomes and impacts of existing programming, and ensuring they could be effectively adapted to the SE Asian context.

However, this more limited approach would not take advantage of some of FCDO's key strategic strengths, in terms of its ability to convene the wider international funding community and utilise long-established relationships with LMIC governments. Both the African Union and ASEAN are on the cusp of publishing revised long-term science, technology and innovation strategies, and there is a window of opportunity for FCDO to engage with these organisations and their member states to support activities that will contribute to the success of these.

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12 Appendix 1 – Proposed Successor Programme Theory of Change

This Theory of Change lays out the way outcomes and impact are improved by the programme activities and outputs. Please note that the following Theory of Change does not exhaustively capture all the suggested outputs.

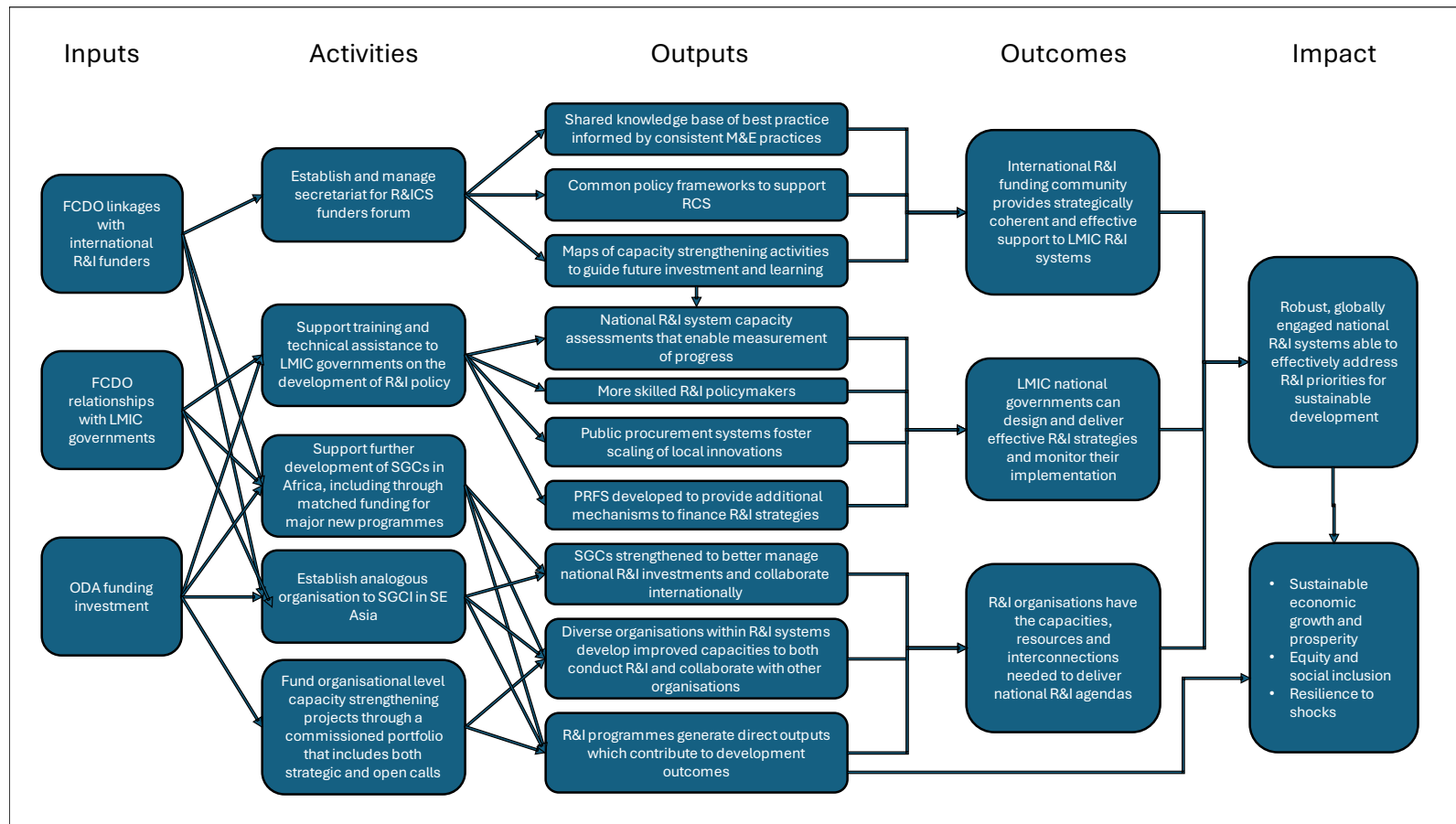


Figure 4: Successor Programme Theory of Change