GCRF Process Evaluation Report, Stage 1b

International Partnership Programme (IPP) Process Evaluation

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Disclaimer

The views expressed in this report are those of the evaluators. They do not represent those of BEIS, GCRF, UKRI or of any of the individuals and organisations referred to in the report.

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List of acronyms

BEIS	Department for Business, Energy and Industrial Strategy
CEA	Cost-Effectiveness Analysis
Co-I	Co-Investigator
COMPASS	Crop Observation, Management and Production Analysis Services System
DAC	Development Assistance Committee
DAMSAT	Dam Monitoring from Satellites
DFID	Department for International Development
DIT	Department for International Trade
DP	Delivery Partner
DMEL	Data, Monitoring, Evaluation and Learning
EASOS	Earth and Sea Observation System
FCDO	Foreign, Commonwealth & Development Office
FCO	Foreign and Commonwealth Office
GCRF	Global Challenges Research Fund
GDPR	General Data Protection Regulation
GEF	Global Environment Facility
GESIP	Gender, Social Inclusion and Poverty
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNI	Gross National Income
HMG	Her Majesty's Government
IPP	International Partnerships Programme
IR	Integrated Review of Security, Defence, Development and Foreign Policy

JICA	Japan International Cooperation Agency
KII	Key Informant Interview
LMIC	Low-to-Middle-Income Country
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MEQ	Main Evaluation Question
NGO	Non-Governmental Organisation
OASIS-TU	South Africa Safety Initiative for Small Vessels' Operational Take-Up
ODA	Official Development Assistance
PASSES	Peatland Assessment in Southeast Asia by Satellite
PI	Principal Investigator
R&D	Research and Development
R&I	Research and Innovation
RE-SAT	Renewable Energy Space Analytics Tool
RMT	Research Management Team
SatDRR	Satellite Enablement for Disaster Risk Reduction
SDG	Sustainable Development Goal
ToC	Theory of Change
ToR	Terms of Reference
UK	United Kingdom
UKRI	United Kingdom Research and Innovation
UKRSA	UK Research Staff Association
UKSA	UK Space Agency
UN	United Nations
VfM	Value for Money

Executive Summary

The Global Challenges Research Fund (GCRF) is a £1.5 billion fund overseen by the United Kingdom's (UK's) Department for Business, Energy and Industrial Strategy (BEIS). GCRF supports pioneering research and innovation that addresses the challenges faced by developing countries. The GCRF evaluation examines the fund's Theory of Change (ToC), from activities to impacts, over a five-year period running from 2020 to 2025. This report is part of the second stage of the evaluation, Stage 1b, which examines GCRF's large-scale strategic initiatives (2021–22). It presents the findings of the process evaluation of the International Partnerships Programme (IPP), delivered by the UK Space Agency (UKSA) as part of GCRF. The process evaluation examines the IPP programme with a view to answering the evaluation question: *'How well are GCRF's signature investments working, and what have they achieved?'*

The evaluation found IPP to be a unique and effective programme that has successfully tested space-based approaches for development, delivering a novel portfolio of development-focused space research and innovation (R&I), taking development considerations into account and showing the ability to adapt and learn over the lifetime of the programme to support greater impact.

GCRF evaluation

The purpose of the evaluation of the GCRF is to assess the extent to which GCRF has contributed to its objectives and impact. The evaluation also aims to provide insights and lessons for the design and management of future Official Development Assistance (ODA) R&I funds. The evaluation is being conducted over the period 2020–25 and is structured into three overarching stages.

This report forms part of the second stage of the evaluation of the GCRF, the focus of which is to examine GCRF's large-scale strategic investments – so-called 'signature investments' – to assess their alignment with the fund's strategy and the extent to which they show signs of delivering anticipated impacts. The overarching evaluation question of this phase is: *How are GCRF's signature investments working, and what have they achieved?*

GCRF's signature investments are diverse. As such, six separate process evaluations have been undertaken to answer this evaluation question. **This report focuses on the IPP programme, a GCRF signature investment managed by UKSA, aimed at using the space sector's capabilities to address the challenges faced by developing countries.**

Overview of the IPP initiative

IPP is a five-year, £152 million programme run by UKSA and funded by GCRF. IPP aims to use the UK space sector's strengths to deliver sustainable economic or societal benefits to developing economies. IPP projects tackle global development challenges across a range of sectors, including forestry, agriculture, maritime and

disaster resilience.[1] Through a combination of developing technical solutions and supporting capacity development in-country, IPP aims to support the use and long-term sustainability of the solutions developed.

Over three calls, 33 projects have been funded in Africa, Asia, Small Island Developing States, Central America and South America.

Evaluation overview

To answer the evaluation question, the IPP process evaluation focuses on investigating the commissioning, managing and implementing processes that are in place in the programme to support ODA R&I in their awards, the extent to which these have worked or not to promote excellence in ODA R&I, and what early results can be observed.

Data collection took place from July to November 2021, with analysis taking place from November 2021 to January 2022.

For this evaluation, interviews, survey data and a review of the documentation supported the findings and analysis. Ten out of the 33 IPP projects were sampled to conduct the award-level analysis, while processes at programme level were reviewed to provide a holistic assessment of the programme. Interviews and document review were conducted at both programme and award levels.

Evaluation findings

IPP made considerable investments into comprehensive structures and processes, from commissioning through to supporting the uptake of the research and innovations, which have been largely effective in supporting challenge-led R&I with development impact; monitoring and evaluation (M&E) processes are a key strength. (EQ 1)

IPP had several structures and processes in place to support challenge-led R&I with development impact. IPP has developed detailed ToCs at award and programme levels, which map activities to the UN Sustainable Development Goals. IPP has clear and detailed processes to commission research, aligned to the challenges faced by developing economies. Management of IPP has been adaptive and well received, although greater 'hands-on' involvement would be welcomed by award holders. IPP has extensive M&E processes at both project and programme levels, supporting projects to measure impact and ensuring learning as the programme evolves. Finally, through varying engagement mechanisms IPP supports the implementation and uptake of research.

Capacity strengthening was a key element in most IPP awards to support the long-term use of the solutions developed and was explicitly assessed in the programme; in practice, capacity strengthening was challenging to deliver and varied across awards. (EQ 2)

Almost all awards had capacity building as a stated objective, and this varied in the form and extent to which it was achieved. Capacity building could be challenging for awards, and award holders were not always prepared for the level of in-country capacity building that was required. Capacity building was assessed at both programme and award levels, although the degree to which this was undertaken varied across awards. As well as developing capacity in low-to middle-income countries (LMICs), some award holders felt the award had a positive impact on UK capacity.

IPP processes to support challenge-led research were generally considered proportionate to the size of the fund, although M&E activities were considered high. (EQ 3)

Processes were generally considered efficient, and flexibility was valued by award holders. IPP has established processes to support projects in delivering value for money (VfM), and projects were demonstrated to be cost-effective when compared to non-space alternatives. In terms of fairness, IPP projects involved consortia of UK and in-country partners, although greater involvement of in-country stakeholders was suggested as beneficial for future awards. IPP aims to promote project sustainability to ensure that the benefits of the project continue after the lifetime of the

[1] https://www.spacefordevelopment.org/ipp/

fund; however, projects continued to find this challenging.

On the whole, IPP awards have made progress towards their outcomes, although not all have been successful, as is the nature of innovations; nevertheless, foundations have been laid for future outcomes to emerge through new networks and capacities. (EQ 4)

IPP successfully demonstrated the utility of space-based approaches to development, although there have been varying levels of success in progress towards desired outcomes and impacts, and not all awards have been successful. IPP has enabled valued and sustainable partnerships and demonstrated a positive economic return to the UK, and IPP funding has helped award holders to leverage funding from other sources. The impact of Covid-19 varied across IPP, with a number of projects being delayed in progress towards desired outcomes.

Good understanding of country contexts, and adaptive management within awards, have helped to overcome barriers, including political and geographical challenges, and enabled progress towards outcomes. (EQ 5)

IPP projects have encountered several barriers to achieving their desired outcomes and impacts, including political challenges, geographical challenges and local capacity challenges. Despite these barriers, several enabling factors supported the delivery of IPP, including a good understanding of the in-country context, and proactive communication and management across project consortia.

IPP has been a unique programme in realising the impact of space in the development sector, providing a large scale of investment and a strong focus on M&E. **(EQ 6)**

Call 3 projects within IPP were the most heavily impacted by the 2021 funding cuts, and this caused a significant negative impact on the project teams as well as reputational damage to the UK more widely.

Conclusions and recommendations

Overall, IPP is an effective programme that has delivered a novel portfolio of development-focused space R&I, taking development considerations into account and showing the ability to adapt and learn over the lifetime of the programme. IPP has been **a unique programme in realising the impact of space in the development sector**. As a test case for the use of space technologies in development the programme has been a success, demonstrating that there are practical applications and value for development in space-based approaches. Beyond laying the groundwork for potential future space-based development programmes, **IPP has also achieved a range of outcomes** – despite some Covid-19-related delays – including establishing **valued and sustainable partnerships** and demonstrating a **positive economic return to the UK** from the investment made. The programme was **carefully designed with development and delivery considerations in mind**, and **M&E processes were a particular strength** of IPP. The programme has demonstrated that an extensive M&E approach ensures that impacts can be measured and lessons can be learned. A good example of learning from ongoing M&E processes that IPP has in place is identifying the **importance of a good understanding of the in-country context**. IPP has demonstrated that this is critical to the success of projects and to the **ultimate sustainability of the technical solution**, which was identified as a key challenge. Both the achievements of the programme and some of the challenges and barriers encountered offer valuable lessons for future space-focused and wider development-oriented R&I programmes, as follows:

Recommendation 1. **Ensure substantial and continued engagement with end users to support technical solutions that meet user needs:** Where future programmes are attempting to deliver technical solutions to support user needs, engagement with local stakeholders and end users is required throughout project design and implementation. This ensures that technical solutions remain appropriate to user needs as well as ensuring that there is 'buy-in' from local stakeholders.

Recommendation 2. **Promote mechanisms to support M&E to ensure that impacts can be measured, and lessons can be learned:** The extensive M&E undertaken by IPP has ensured

that outputs and impacts from the awards can be documented, as well as lessons learned as the programme has evolved. This has ensured that IPP had adapted as it has progressed, as well as being able to provide broader lessons for the development and space sector. To ensure that M&E frameworks are taken up successfully, they should be developed at programme establishment.

Recommendation 3. **Ensure that time scales and targets remain realistic to get the maximum impact and utilise project outputs effectively:** Where future programmes are addressing complex challenges or working within novel environments, timescales must be appropriate to ensuring that outputs can be achieved during the lifetime of the project. This ensures that impacts can be fully realised and that technical solutions and tools can be handed over to end users in a useful manner.

1 Introduction

The Global Challenges Research Fund (GCRF) evaluation examines the fund's Theory of Change (ToC), from activities to impacts, over a five-year period running from 2020 to 2025. The evaluation is structured into three stages owing to the complex nature of the fund. This report is part of the second stage of the evaluation, Stage 1b, which examines GCRF's large-scale, strategic GCRF initiatives. It focuses on the International Partnerships Programme (IPP), a GCRF signature investment aimed at using the space sector's capabilities to address the challenges faced by developing countries.

1.1 Overview of the programme

GCRF is a £1.5 billion fund announced by the United Kingdom (UK) government in late 2015, an unprecedented investment into pioneering research that addresses the challenges faced by developing countries. GCRF forms part of the UK's Official Development Assistance (ODA) commitment and aimed to contribute to the achievement of the UK's 2015 aid strategy's goals.

GCRF aims to harness UK science in the search for solutions to the challenges faced by developing countries while also developing the UK's ability to deliver cutting-edge research and innovation (R&I) for sustainable development. GCRF is implemented by 17 of the UK's R&I funders, which commission R&I as delivery partners (DPs).

GCRF's ToC sets out GCRF's expected impact, to emerge over a 10-year period:

> '*Widespread use and adoption of GCRF-supported research-based solutions and technological innovations enables stakeholders in LMICs [low-to-middle-income countries] to make progress at scale towards addressing complex development challenges. These efforts will contribute to the achievement of the SDGs, enhancing people's wellbeing, improving equality for people of all genders, promoting social inclusion, economic development and environmental sustainability in developing countries. These improvements will be sustained into the future by enduring equitable research and innovation partnerships between the UK and LMICs, and enhanced capabilities for challenge-oriented research and innovation in all regions*'.

The GCRF strategy sets out three objectives to support this impact:

- Promote challenge-led disciplinary and interdisciplinary research, including the participation of researchers who may not previously have considered the applicability of their work to development issues.
- Strengthen capacity for research, innovation and knowledge exchange in the UK and developing countries through partnership with excellent UK research and researchers.

- Provide an agile response to emergencies where there is an urgent research need.

Through these objectives, GCRF aims to contribute to realising the ambitions of the UK aid strategy and to making practical progress on the global effort to address the United Nations' (UN's) sustainable development goals (SDGs). As a secondary objective, GCRF also aims to build the position and role of the UK R&I sector as global leaders in addressing global development challenges. GCRF's ToC and the ambitions set out in its the strategy provide the overall framing for the evaluation to assess progress.

GCRF's evaluation, Stage 1b : Understanding GCRF's processes and early results

The purpose of GCRF's evaluation is to assess the extent to which GCRF has contributed to its objectives and impact. The overall GCRF evaluation takes a theory-based design, tracking the GCRF ToC over the life of the fund (see Annex 1). The evaluation is conducted over five years and across three stages. The evaluation started in 2020, when GCRF was in the final year of its first phase of five years (2016–20). Stage 1a (2020–21) examined the foundations for achieving development across the fund, addressed through four modules: management; relevance and coherence; fairness; and gender, social inclusion and poverty (GESIP).[2]

Box 1. What is a 'programme' in GCRF?

In the GCRF context, programmes are designed and managed by GCRF's DPs. They involve the allocation of an amount of funding for the commissioning of a specific portfolio of awards. A set of specific objectives guides commissioning of projects to contribute to GCRF's goals. Programmes often specify ways of working, e.g. in partnership with institutions in low and middle-income countries, through interdisciplinary work and involving stakeholder engagement. Research topics and countries are not usually specified although, in the innovation programmes, development challenges and geographies are framed and awards are commissioned to respond to these. The 'signature programmes' involve more hands-on management of the portfolio by the delivery partner than other calls, in order to optimise the portfolio's development impact potential. This programme management includes elements such as policies and frameworks that have to be met, such as gender, equity and inclusion, detailed monitoring and reporting, cohort linkages, support for skills building from the programme level, and links to wider networks of collaborators and research users.

Stage 1b began in April 2021, with six process evaluations of GCRF's 'signature investments' – large-scale programmes that aim to deliver on GCRF's strategic objectives and where there has been considerable investment into programme management processes to promote excellent ODA R&I with development impact. A fund-wide survey and a Value for Money (VfM) assessment were also conducted in this phase.

This stage seeks to answer the overarching evaluation question:

How are GCRF's signature investments working, and what have they achieved?

[2] BEIS (2022) Evaluation of the Global Challenges Research Fund: Stage 1a: Synthesis Report of evidence on integration of relevance, fairness, gender, poverty, social inclusion in funded activities https://www.newton-gcrf.org/wp-content/uploads/2022/02/gcrf-evaluation-1a-synthesis-report.pdf

This report focuses on the process evaluation of IPP,[3] which aimed to provide intellectual and strategic leadership for a series of strategic research portfolios and to strengthen the coordination across multiple DPs.

Overview of IPP

IPP is a five-year, £152 million programme run by the UK Space Agency (UKSA). IPP aims to use the UK space sector's strengths to deliver sustainable economic or societal benefits to developing economies.[4]

The primary aim of IPP is to deliver a space-enabled ODA-compliant[5] programme that provides measurable and sustainable economic or societal benefits to its beneficiaries.[6] This is complemented by three secondary aims:

- Develop valued and sustainable partnership arrangements which lead to growth opportunities for the UK space sector.
- Demonstrate the additionality that space-enabled solutions and applications have over terrestrial systems.
- Use the space sector's unique expertise to lead in delivering overseas aid or work with others in their programmes to complement existing ODA efforts.

IPP was established in 2016 and there have been three calls to date.

In Calls 1 and 2, 33 projects have been funded.[7] Countries targeted by the projects span Africa, Asia, Small Island Developing States, Central America and South America.

Figure 1: Countries targeted by IPP projects

[3] During this phase, six process evaluations of signature investments were carried out, including GROW (UK Research Innovation (UKRI)); Interdisciplinary Hubs (UKRI); FLAIR (Royal Society); International Partnerships Programme (UK Research Staff Association (UKRSA)); Challenge Leaders and portfolios (UKRI); and the Four Nations Funding Councils' awards to UK higher education institutions.

[4] IPP Portfolio. June 2018. https://www.spacefordevelopment.org/library/international-partnership-programme-call-1-projects-2/

[5] OECD defines ODA compliant research activities as follows: *"Research includes financing by the official sector, whether in the donor country or elsewhere, of research into the problems of developing countries. This may be either (i) undertaken by an agency or institution whose main purpose is to promote the economic growth or welfare of developing countries, or (ii) commissioned or approved, and financed or part-financed, by an official body from a general purpose institution with the specific aim of promoting the economic growth or welfare of developing countries. Research undertaken as part of the formulation of aid programmes in central or local government departments or aid agencies is considered as an administrative cost."* OECD (2018) in https://one.oecd.org/document/DCD/DAC/STAT(2018)9/FINAL/en/pdf

[6] IPP Portfolio. June 2018. https://www.spacefordevelopment.org/library/international-partnership-programme-call-1-projects-2/

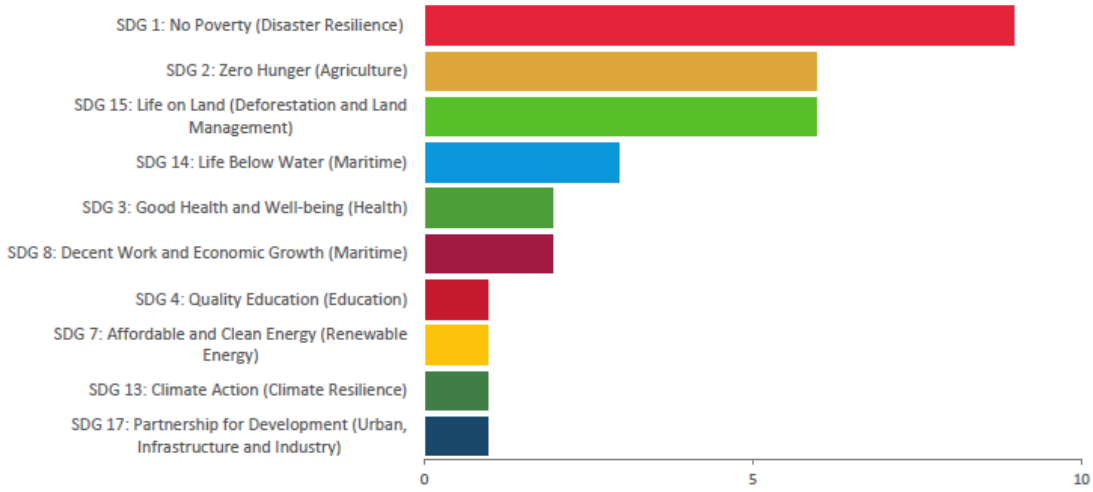
[7] Due to the ODA cuts, Call 3 projects did not enter their implementation phase.

Source: IPP Midline Evaluation[8]

IPP projects tackle global development challenges across a range of sectors, including forestry, agriculture, maritime and disaster resilience.[9] Through a combination of developing technical solutions and supporting capacity development in-country, IPP aims to support the use and long-term sustainability of the solutions developed.

IPP projects have a direct, measurable impact on 10 UN SDGs with the 10 most targeted sectors, including disaster resilience, agriculture and deforestation and land management.[10]

Figure 2: UN SDGs targeted by IPP projects



Source: IPP Midline Evaluation[11]

1.2 Aims and scope of the IPP process evaluation

The IPP process evaluation aims to answer the main evaluation question (MEQ) above by investigating structures and processes involved in commissioning, managing and implementing IPP awards, the extent to which these have promoted excellence in ODA R&I, and their early results. The IPP evaluation encompasses all R&I investments made in the programme since its inception in 2018. It also looks at the programme processes and how these have cascaded to and been applied at award level, in order to develop a holistic assessment of the programme and its portfolio (see Section 1.1 for an overview of IPP).

We reviewed ODA R&I management processes, including:

- Scoping and framing of initiative for relevance and coherence;
- ToC and shared vision;
- Commissioning and selection of portfolios, and awards within portfolios, to deliver against challenge;

[8] IPP Summary of Midline Evaluation. July 2020. https://www.spacefordevelopment.org/library/development-from-space-a-summary-of-the-ipp-midline-evaluation/

[9] https://www.spacefordevelopment.org/ipp/

[10] IPP Summary of Midline Evaluation. July 2020. https://www.spacefordevelopment.org/library/development-from-space-a-summary-of-the-ipp-midline-evaluation/

[11] IPP Summary of Midline Evaluation. July 2020. https://www.spacefordevelopment.org/library/development-from-space-a-summary-of-the-ipp-midline-evaluation/

- Risk factors identified and mitigated;
- Hands-on portfolio management;
- Flexibility to respond to events and emergencies;
- Addressing barriers to interdisciplinary working;
- Promoting coherence between portfolios;
- Facilitating learning for adaptation and legacy; and
- M&E and regular reporting.

The evaluation sets out a series of sub-EQs and criteria that aim to capture processes and structures that we would expect to see in an ODA challenge fund such as GCRF, building on the findings from Stage 1 (see below).

Data collection took place from July to November 2021, with analysis taking place from November 2021 to January 2022.

Evaluation users

Our evaluation design is grounded in a utilisation focus. This requires having clarity on who the different stakeholders of the evaluation are at the start of the evaluation, as well as how and when they want to use the findings. The evaluation is designed in such a way that it engages stakeholders at the most appropriate moments in the process. Ultimately, a utilisation-focused evaluation should be judged on its utility and actual use.

The primary users of the evaluation are the Department for Business, Energy and Industrial Strategy (BEIS), including the Science Technology Innovation Analysis Team, the wider ODA team in Swindon and London offices, including the Research Management Team (RMT), Data, Monitoring, Evaluation and Learning (D-MEL) Team and Programme Management Office, and the Delivery Partners (DPs).

Box 2. Findings from Stage 1a, 2020–21

The process evaluations build on the findings from Stage 1a. The Stage 1a Management Review and Synthesis Report on the integration of relevance, fairness, gender, poverty and social inclusion on GCRF were published in February 2022.[12] Overall, the Stage 1a evaluation found that GCRF is making clear progress in terms of establishing the foundations for development impact – becoming relevant, coherent, well-targeted, fair, gender sensitive and socially inclusive. Strengths were seen especially in the 'signature investments' such as IPP, GROW, Hubs and FLAIR. However, inherent challenges in the fund's size and complicated delivery architecture meant that progress has been varied across the portfolio, and important gaps remain, especially around managing for development impact and how poverty is addressed. The evaluation recommended that GCRF do the following:

- Establish a more consistent challenge fund identity, with the cultures, shared ownership and management structures to support this. A challenge fund identity and associated processes was seen most strongly in the signature investments, with the need to explore this in more depth in Stage 1b process evaluations through specific criteria.
- Establish quality standards for 'ODA R&I excellence' to optimise the combination of excellent research and innovation with development impact. The synthesis identified an unresolved tension that at times privileged conventional research excellence and took a lower, compliance approach to the fundamentals of development impact. The need to integrate and promote both dimensions of excellence in ODA R&I was brought into the Stage 1b process evaluation framework to understand in more depth if this had been achieved in the signature investments.
- Establish a collective, fund-wide monitoring and learning process that supports learning between BEIS, the DPs and award holders to support adaptive management at different levels. This is a fund-wide challenge but was also brought into the process evaluation framework to investigate the extent to which monitoring and learning were supported in the signature programmes.

A consistent request from BEIS has been for the evaluation to illustrate what 'good looks like' for a challenge fund like GCRF. The evaluation matrix for the Stage 1b process evaluations includes criteria that reflect the Stage 1a recommendations and the structures and processes that we would expect to see in effective challenge funds (see Section 2.2 for the evaluation matrix).

1.3 Strategic and policy context

The first years of GCRF's evaluation, 2020–22, have seen significant changes in the strategic, policy and economic context of GCRF. These include a new policy framework that integrates defence and foreign policy, including ODA, and significant budget cuts for 2021–22 as a result of a reduction in the UK's ODA commitment from 0.7% of GNI to 0.5%, following the

[12] Global Challenges Research Fund (GCRF): Stage 1a evaluation. https://www.gov.uk/government/publications/global-challenges-research-fund-gcrf-stage-1a-evaluation

budget impacts of the UK government's large-scale response to the Covid-19 pandemic. In 2021 the policy decision was made to wind down GCRF by 2025, with implications for the evaluation.

The Integrated Review of Security, Defence, Development and Foreign Policy (IR), published in March 2021,[13] sets out the broader UK policy vision for foreign policy, including ODA, to 2030. This vision includes an increased commitment to security and resilience in the context of UK national interests in collaboration with other nations. The review had an explicit focus on defence, homeland security and the application of science and technology to grow the UK's cyber power. Although it emphasises a focus on multilateral solutions, the IR does not focus in detail on international development, the strategy for which has not yet been published at the time of writing, but which is due in 2022. It nevertheless now guides the work of the new Foreign, Commonwealth & Development Office (FCDO) (formed in August 2020 by merging the Foreign and Commonwealth Office (FCO) and the Department for International Development (DFID)), and that of all ODA-spending departments, including BEIS, which funds GCRF.

As the outcome of the IR, a new strategic framework outlines the government's national security and international foreign policy objectives. The framework includes four dimensions: sustaining strategic advantage through science and technology; shaping the open international order of the future; strengthening security and defence at home and overseas; and building resilience at home and overseas, prioritising efforts to tackle climate change and biodiversity loss.[14]

Science and technology are central to achieving the policy objectives, with a focus on emerging technologies in particular and the translation of innovation into practical applications, including in developing countries. In this sense, GCRF continues to remain relevant. Further, the national Research and Development (R&D) roadmap outlines that ODA will continue 'to support R&D partnerships within developing countries sharing research expertise in support of the SDGs', with Science and Technology remaining one of the UK's strategic priorities for ODA spending.[15]

The review also sets out seven priorities for UK aid, including supporting open societies and conflict resolution, humanitarian preparedness and girls' education, with climate change a high priority. The review reiterates the UK's commitment to the SDGs and states that poverty reduction will remain central to the work of FCDO.

Geographically, the IR describes a pivot in the UK's interests towards the Indo-Pacific region, although Africa and other developing regions remain a priority. As an ODA fund with an emphasis on low and middle-income countries, GCRF's main focus has been on Africa, and to a lesser extent Asia. The Indo-Pacific region has had less coverage. However, the breadth and diversity of GCRF should enable its continued relevance to this new geographical tilt.

Alongside a new foreign policy and international development framework, the Covid-19 pandemic has significantly impacted on ODA spending and management, with resulting cuts to the GCRF budget in 2021–22. The economic recession and resultant fiscal policies have affected the Spending Review that was carried out in autumn 2020, limited to a one-year timeframe. Reflecting the economic impact of the pandemic, the ODA commitment was

[13] 'Global Britain in a competitive age. The Integrated Review of Security, Defence, Development and Foreign Policy', March 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age-_the_Integrated_Review_of_Security__Defence__Development_and_Foreign_Policy.pdf

[14] As above.

[15] 'UK Research and Development Roadmap', July 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/896799/UK_Research_and_Development_Roadmap.pdf

reduced from 0.7% to 0.5 % of gross national income (GNI) as a temporary measure.[16] While the IR commits to 'spend 0.7% of GNI on development when the fiscal situation allows', the ODA reduction in 2021 resulted in spending cuts for ODA-spending government departments – including BEIS, with consequential cuts to GCRF and the budgets of its DPs.[17]

On 11 March 2021 UKRI stated that the BEIS ODA allocation to UKRI 'has reduced significantly in planned ODA expenditure for FY21/22, leading to a £125m budget and a £120m gap between allocations and commitments'.[18] The implementation of these sudden budget reductions, which amounted to around 70% of committed spend, affected all GCRF's DPs and investments across the board, with grants being delayed, reprofiled or, in some cases, terminated. In March UKRI, as the largest DP involved in GCRF, stated that it would be unable to provide GCRF funding beyond July 2021.

September 2021 saw a return to a three-year Spending Review and an improved picture for GCRF after the turmoil of the coronavirus pandemic, although – in response to the new policy framework - the decision was made to wind down BEIS's ODA funds, GCRF and Newton by 2025. Following this budget, BEIS's ODA allocation stabilised and some improvements were seen. Existing GCRF commitments are now able to be met until March 2025, which means that commissioned projects, including the large-scale flagship programmes, will be supported for the remainder of their terms to 2025. The cuts from 2020/21, however, will not be reimbursed, so projects are having to accommodate net budget reductions by reducing their scope.

The policy decision to wind the fund down by early 2025 means that spending in 2022–23 is on a declining trajectory, from £124 million in 2022–23 to £77.9 million in 2023–24 and £14.6 million in the final year, 2024–25. These circumstances represent a curtailment in the original ambition envisioned for GCRF in its ToC, which was to maintain investment in development R&I over a 10-year period.[19] The assumption at the time the ToC was developed (2017–18) was that there would be a second, impact-oriented, phase of GCRF from 2021 to 2025. In this phase, it was expected that many of the larger awards (notably UKRI's Interdisciplinary Hubs) and other investments would shift focus onto impact activities. With the winding down of the fund, these investments will now not take place, with implications for the achievement of GCRF's midterm outcomes and impact.

Effectively, there are only two years of remaining R&I activity, as in the final year programmes will be focused on finalising outputs. Award teams and, potentially, partnerships will disband and move on. BEIS has decided nevertheless that the evaluation will continue to track GCRF up to its close in March 2025. For Stage 1b, the evaluation has been adjusted to take these challenges into account, with specific EQs focusing on the impacts of Covid-19 and budget reductions. For future phases, the evaluation is in the process of being refocused to reflect the winding down of the fund and the need to capture lessons and document GCRF's accomplishments and legacy for LMICs and the UK.

[16] 'Spending Review: Reducing the 0.7% aid commitment Insight', Thursday, 26 November 2020. https://commonslibrary.parliament.uk/spending-review-reducing-the-aid-commitment/

[17] 'Global Britain in a competitive age. The Integrated Review of Security, Defence, Development and Foreign Policy', March 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age-_the_Integrated_Review_of_Security__Defence__Development_and_Foreign_Policy.pdf

[18] UKRI Official Development Assistance letter 11 March 2021. https://www.ukri.org/our-work/ukri-oda-letter-11-march-2021/

[19] Barr, J. *et al.*, 2018, GCRF Foundation Stage Report. https://www.gov.uk/government/publications/global-challenges-research-fund-gcrf-foundation-stage-evaluation

1.4 Structure of the report

The structure for this report is as follows:

Section 1 provides an introduction to IPP and provides an overview of the process evaluation. It sets out the context of the wider evaluation process as well as situating it within the strategic and policy context for this specific evaluation.

Section 2 describes the approach and methodology, including evaluation questions (EQs) and criteria as well as the data collection instruments, sampling approach and analysis.

Section 3 presents the findings against EQs 1–6.

Section 4 provides conclusions, lessons and high-level recommendations for the design of similar initiatives.

2 Approach and methodology

The overall GCRF evaluation takes a theory-based design, tracking the GCRF ToC over the projected 10 years of the fund. For Stage 1b, we developed an evaluation framework to assess how well 'ODA excellence' has been supported in the signature investments, drawing on the findings from Stage 1a, GCRF's ToC and the literature on challenge funds. This section provides an overview of our approach and the EQs and criteria that the process evaluation aims to answer. It also summarises the data collection method, sampling, data analysis and our key strengths and limitations.

2.1 Overview of approach

The overall GCRF evaluation takes a theory-based design, tracking the GCRF ToC over the projected 10 years of the fund (see the Inception Report 2020 for more details). The Stage 1b process evaluations (together with the survey and VfM assessment) provide an opportunity to test the early stages of the GCRF ToC and its assumptions to understand how the signature investments have integrated the key processes and strategies proposed in the ToC into their programmes in order to optimise the ODA excellence and impact potential of their awards.

Stage 1b of the GCRF evaluation focuses on MEQ2: *How well are GCRF investments working, and what have they achieved?* While the focus is on process, the evaluation also seeks to capture insights on context, causal mechanisms and early-stage outcomes.

Conceptual framing of 'ODA research excellence' in GCRF

From April to June 2021, the evaluation completed a scoping phase to finalise the approach and method for Stage 1b. To deliver on its ambitions, GCRF goes beyond considering research excellence alone to promoting challenge-led excellent research with impact. This incorporates a wider understanding of what GCRF as an ODA fund should strive towards, which we term as 'ODA research and innovation excellence'.

However, in Stage 1a the evaluation found that some investments in the portfolio are more aligned with ODA challenge-led R&I than others. The evaluation concluded that approaching GCRF more explicitly as an ODA R&I challenge fund would provide more insights into 'what good looks like' for GCRF's performance (see Box 3).

Box 3. Findings from Stage 1a, 2020–21

The process evaluations build on the findings from Stage 1a. The Stage 1a Management Review and Synthesis Report on the integration of relevance, fairness, gender, poverty and social inclusion on GCRF was published in February 2022.[20] Overall, the Stage 1a evaluation found that GCRF is making clear progress in terms of establishing the foundations for development impact – becoming relevant, coherent, well- targeted, fair,

[20] Global Challenges Research Fund (GCRF): Stage 1a evaluation https://www.gov.uk/government/publications/global-challenges-research-fund-gcrf-stage-1a-evaluation

gender sensitive and socially inclusive. Strengths were seen especially in the 'signature investments' such as IPP, GROW, Hubs and FLAIR. However, inherent challenges in the fund's size and complicated delivery architecture meant that progress has been varied across the portfolio, and important gaps remain, especially around managing for development impact and how poverty is addressed. The evaluation recommended that GCRF do the following:

- Establish a more consistent challenge fund identity, with the cultures, shared ownership and management structures to support this. A challenge fund identity and associated processes was seen most strongly in the signature investments, with the need to explore this in more depth in Stage 1b process evaluations through specific criteria.
- Establish quality standards for 'ODA R&I excellence' to optimise the combination of excellent research and innovation with development impact. The synthesis identified an unresolved tension that at times privileged conventional research excellence and took a lower, compliance approach to the fundamentals of development impact. The need to integrate and promote both dimensions of excellence in ODA R&I was brought into the Stage 1b process evaluation framework to understand in more depth if this had been achieved in the signature investments.
- Establish a collective, fund-wide monitoring and learning process that supports learning between BEIS, the DPs and award holders to support adaptive management at different levels. This is a fund-wide challenge but was also brought into the process evaluation framework to investigate the extent to which monitoring and learning were supported in the signature programmes.

A consistent request from BEIS has been for the evaluation to illustrate what 'good looks like' for a challenge fund such as GCRF. Therefore, to better frame GCRF's ambitions from the challenge fund perspective, and to define the key characteristics of a fund of this nature, we conducted a rapid scan of the literature for challenge funds in international development and mission-oriented R&I (see the Stage 1b Approach Paper, 2021 in Annex 4).

Building on this review, the GCRF ToC and the findings from Stage 1a, a **single overarching evaluation framework** was developed for all six process evaluations and the fund-wide survey (set out in Section 2.2). The evaluation framework in Section 2.2 sets out the EQs and the combined criteria for assessing ODA excellence in design and delivery of GCRF's signature investments. The specific features of each signature investment will be captured via tailored criteria within the evaluation framework (see Section 2.2 for the full evaluation matrix).

Summary of the evaluation method

The detailed methodology is set out in subsequent sections. In summary, the evaluation has examined the EQs through an iterative three-step approach:

1. **Examining the programme level to achieve a broad overview of the signature investment and its processes**, informed by a document review and analysis of the programme-specific sub-set of survey data.
2. **A deeper, qualitative dive into a sample of awards from within each investment to gain deeper insights into processes and early results from the programme**, informed by key informant interviews (KIIs) and triangulated with specific documentation from each award.

3. **A holistic assessment of the overall programme**, examining the extent to which programmatic approach has enabled the awards to work as a portfolio that is more than the 'sum of the parts'.

Triangulation was the main approach to strengthen the evidence across all three levels:

- **Examples and triangulation within interviews**: Triangulation was applied within interviews to explore issues from different angles and elicit examples to support reports of achievements. These examples were then cross-checked with other data sources.
- **Triangulation between stakeholder types in both quantitative and qualitative data collection**: BEIS staff, DP programme managers, award holders and partners, increasing the number of different perspectives on a project/programme.
- **Triangulation between interview data, survey data, award and programme monitoring information and other documentary sources**: This included project annual reports, reporting through ResearchFish and programme review documentation that helped us to validate stakeholder testimony about processes and project achievements.

2.2 Evaluation questions and criteria

All Stage 1b process evaluations utilise a single overarching evaluation framework, which draws on the GCRF ToC outcomes and assumptions as well as insights from the literature on challenge funds and mission-oriented R&I in international development (see Annex 1). The overarching EQ has been broken down in the evaluation framework into seven EQs and associated criteria to support the assessment of the ODA R&I processes.

These EQs were updated from the original Terms of Reference (ToR) to reflect the findings of the Stage 1b evaluation, a rapid literature review of challenge funds. The EQs were also adapted to reflect the structural and contextual changes around Covid-19 and an overall reduction in ODA funding that affected GCRF in 2021–22.

Table 1: below sets out the detailed evaluation framework. Through detailed criteria EQs 1–2 we examine the structures and processes that we would expect to find in a challenge fund to deliver ODA R&I with impact. EQ 3 examines the extent to which processes and structures have been efficient and timely and fair to partners; EQ 4 looks at the evidence for what has been achieved and emerging outcomes; EQ 5 explores the unique features of the signature programmes that have enabled them to overcome barriers in the thematic and geographical contexts; EQ 6 aims to establish the uniqueness and additionality of GCRF funding. Finally, EQ 7 captures lessons for future funds.

Table 1: High-level evaluation framework

EQ	Criteria	Data sources and methods for all EQs
EQ 1. To what extent are structures and processes in place to support challenge-led research and innovation with development impact, within signature investment awards and programmes?	1a. ODA R&I management (at programme and award levels): ▪ Scoping and framing of challenge for relevance and coherence ▪ ToC and shared vision ▪ Commissioning and selection of portfolio to deliver against challenge ▪ Capacity needs assessed and identified ▪ Risk factors identified and mitigated ▪ Hands-on programme management (e.g. cohort building, aggregate-level R&I into use) ▪ Flexibility to respond to events and emergencies, e.g. Covid-19 ▪ Addressing barriers to interdisciplinary working ▪ Promoting coherence between awards ▪ Facilitating learning for adaptation and legacy ▪ M&E and regular reporting 1b. ODA R&I excellence in design and implementation: ▪ Relevance + coherence in design and delivery ▪ Strategic/holistic/system lens, including interdisciplinarity ▪ Negative consequences mitigated and a 'do no harm' approach ▪ Gender responsiveness and poverty addressed in design and processes ▪ Inclusiveness (SEDI) addressed within design and research processes ▪ Capacity needs identified and assessed ▪ Fairness in engagement with local research ecosystems/stakeholder engagement ▪ Positioning for use in design and delivery ('fit for purpose' engagement and dissemination strategies; relationship building; best platforms for outputs for the target audience and users)	**Data sources:** KIIs with stakeholders at BEIS, DPs, awards and partners, as well as informed externals Survey data with Principal Investigators (PIs) and Co-Investigators (Co-Is) **Methods:** Document reviews KIIs with BEIS Fund managers KIIs with DP programme managers KIIs with award managers KIIs with award partners in LMICs KII with externals, e.g. panel experts, others Survey analysis Programme and award documents
EQ 2. To what extent are structures and processes in place	▪ Clear ToC for how capacity development contributes to the desired programme outcomes	

EQ	Criteria	Data sources and methods for all EQs
to strengthen R&I capacity in LMICs and the UK?	▪ Analysis/understanding of local R&I ecosystems and capacity needs ▪ Capacity support that aligns with good practice provided to individuals, organisations and/or R&I infrastructure ▪ Fairness considerations integrated	
EQ 3. To what extent are processes [to support challenge-led research] efficiently implemented: are they proportionate for UK and LMIC stakeholders, timely and do they offer value for money?	▪ Efficiency and timeliness of processes ▪ Proportionality for size of investment ▪ Fairness for partners ▪ VfM rubrics	
EQ 4. To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?	▪ Results and outcomes from programme ToCs; examples ▪ Impact of and adaptation to Covid-19 on progress ▪ Unintended outcomes (positive and negative)	
EQ 5. What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes, in different contexts? (Context, causal factors)	▪ Contextual factors shaping the interventions and outcomes: o Maturity of the field o Research capacity strengthening o Risk in the research environment (i.e. organisational contexts' support for research) o Risks in political environment (i.e. under-developed policy environment, unstable political context, local recognition of the issues and LMIC communities themselves) o Risks in data environment (i.e. data availability and agreement on measures) o Examples of success factors e.g. the necessary factors proposed in the GCRF ToC for navigating barriers/facilitators	

EQ	Criteria	Data sources and methods for all EQs
	○ Networks, credible evidence/innovation and new capabilities mobilised to amplify change ○ Iterative engagement by GCRF programmes and projects, responding to opportunities to amplify change ○ Other features and factors, e.g. a focus on GESIP, scoping demand, flexibility in the budgeting model	
EQ 6. What can be learned about the additionality (uniqueness) of GCRF funding from: ▪ how the signature investments have adapted their approach in response to Covid-19 ▪ the impact of the 2021 funding cuts on the signature investments?	▪ Extent to which GCRF funding is instrumenal for achieving the outcomes or can be substituted ▪ Additionality of knowledge funded by GCRF and whether the equivalent could be secured through other sources in same time frame/quality etc (as defined in the VfM rubric) ▪ Interventions within awards and programmes that rely on GCRF funding ▪ Other aspects that GCRF funding is instrumental for	
EQ 7. What lessons can inform improvements in the future delivery of the signature investments & promote learning across GCRF?	▪ Specific insights and lessons from the award that stand out as exemplary practice, strong processes, outcomes and results that can be learned from success factors, reasons why ▪ Capture also specific areas for improvement in the award, areas of underperformance and reasons why	

2.3 Selection and sampling

For this evaluation ten out of the 33 IPP projects were sampled in relation to:

- project award size;
- spread across GCRF challenge areas;
- start date (Call 1 versus Call 2).

A summary of the projects and their aims is provided below.

Table 2: Projects in sample

Project Title	Aim	Countries
Earth and Sea Observation System (EASOS)	To provide government agencies in Malaysia with a user-centred dashboard to deliver information and analysis on environmental challenges.	Malaysia
Renewable Energy Space Analytics Tool (RE-SAT)	To develop a software platform to support Small Island Developing States with their transition from fossil fuels to renewable energy.	Fiji, Solomon Islands, Vanuatu
Improving forest monitoring systems through better application of satellite data (Forests 2020)	To improve forest monitoring through the advanced use of Earth observation imagery from satellite data.	Belize, Brazil, Colombia, Ghana, Indonesia, Kenya, Mexico
South Africa Safety Initiative for Small Vessels' Operational Take-Up (OASIS-TU)	To create a system which can track small vessels at sea to ensure small vessel maritime safety and monitor and manage activities.	South Africa
Peatland Assessment in Southeast Asia by Satellite (PASSES)	To develop a comprehensive peatland monitoring service using satellite measurement techniques.	Indonesia, Malaysia
Satellite Enablement for Disaster Risk Reduction in Kenya (SatDRR)	To use satellite services for disaster risk management, including to improve communication post-disaster and to support strategic planning for disaster relief.	Kenya
Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire	To use satellite imagery and advanced spatial analysis to improve forest monitoring and quantify the economic and ecological value of land.	Côte d'Ivoire
CommonSensing	To use satellite remote sensing for applications to support climate change resilience in Fiji, Solomon Islands and Vanuatu.	Fiji, Solomon Islands, Vanuatu

Mexican Crop Observation, Management and Production Analysis Services System (COMPASS)	To support Mexican farmers to improve their technical, environmental and financial performance by using Earth observation data, alongside field measurements and computer modelling.	Mexico
Space-based dam monitoring (Dam Monitoring from Satellites (DAMSAT)	To use Earth observation tools to achieve a high level of automation for dam monitoring to provide increased accuracy of monitoring over large areas.	Peru

Figure 3: GCRF challenge areas in sample

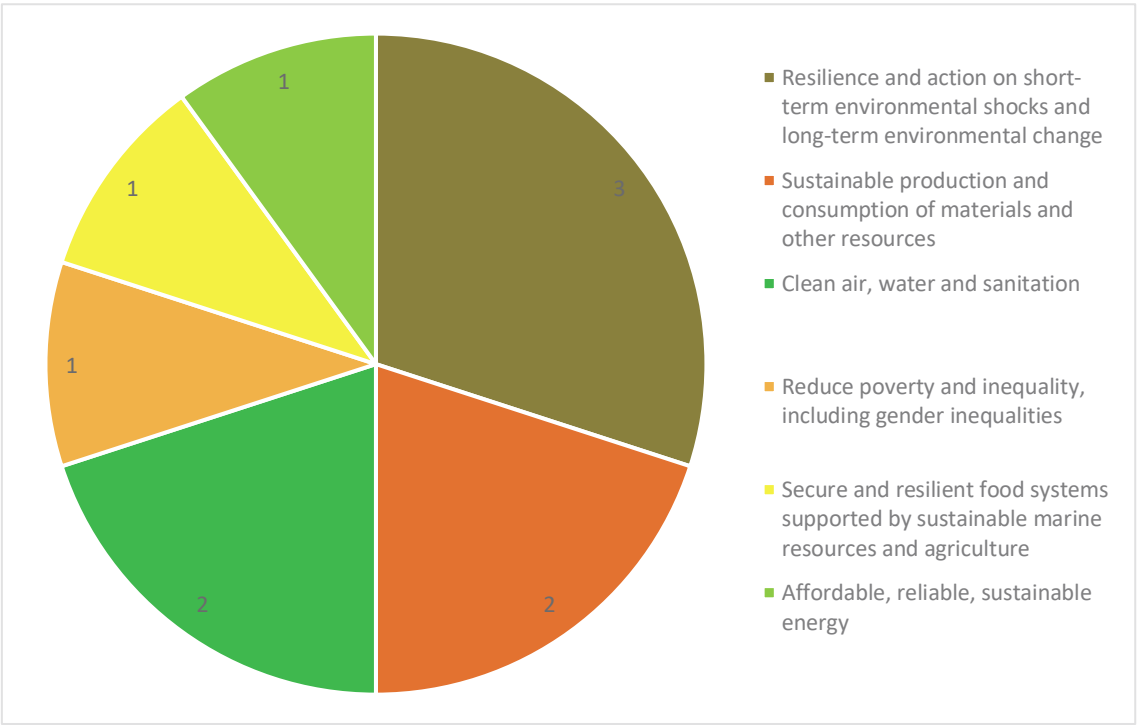
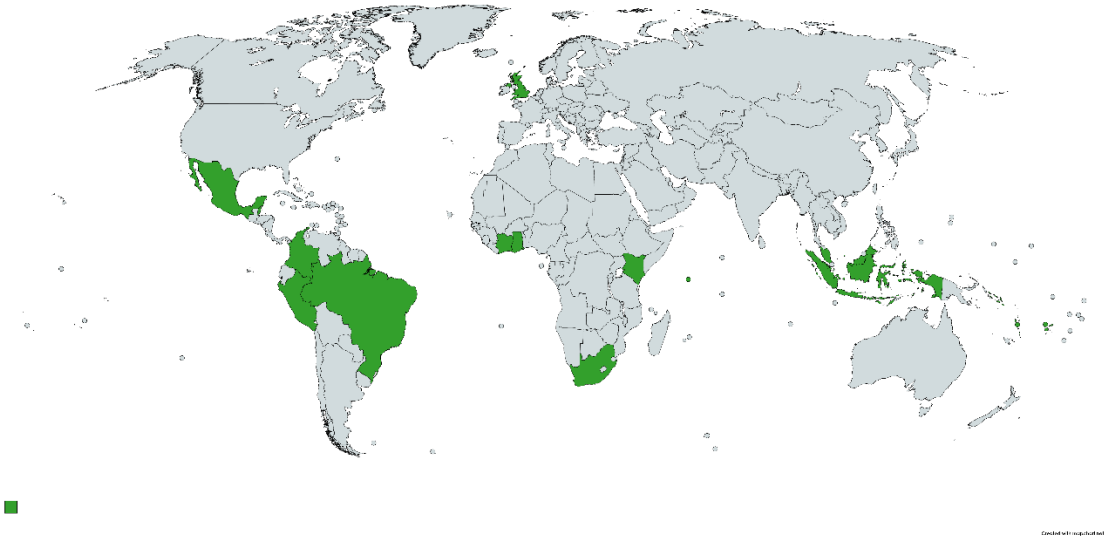


Figure 4: Geographic coverage of sampled IPP projects



2.4 Data collection and overview of the evidence base

In order to conduct this evaluation, data was collected using a combination of methods, including a survey, interviews and review of documentation. Data was collected during a period when Covid-19 was disrupting people's working patterns. Although Covid-19 impacted on award holders in terms of implementation, as detailed in Sections 1.3 and 3.4, there was no real impact of Covid-19 on the process evaluation, which was designed as a remote exercise from the outset. All interviews were conducted remotely via Teams or Zoom, and the desk review was conducted remotely. Internal team discussions, analysis and report writing were done remotely, using Itad's internal Teams and SharePoint system.

KIIs and document review

The study team conducted interviews with a range of stakeholders at both award and programme levels. 36 interviews were completed in total: 10 at programme level and 26 at award level. Topic guides are included in Annex 3.

We also conducted a review of programme and award-level documentation. All documentation reviewed was provided by UKSA. At programme level, documents reviewed included baseline and midline evaluation reports, cost-effectiveness analysis, monitoring and evaluation (M&E) plans, application forms, application assessment sheets and strategy documents. At award level, documents included baseline, midline and endline evaluation reports, monthly progress reports, sustainability reports, knowledge sharing and communication reports, cost-effectiveness analysis and project logframes. Table 3: shows an overview of the evidence base.

Table 3: Overview of the evidence base for IPP

Data source	Type	Number
KIIs	Award-holders	26
	Programme staff at UKSA, Caribou Space[21]	5
	Panel members and independent assessors	5

[21] Caribou Space is an independent organisation which supports the UKSA with M&E.

	Total	**36**
Documents reviewed	Award level: baseline, midline and endline evaluation reports, monthly progress reports, sustainability reports, knowledge sharing and communication reports, cost-effectiveness analysis and project logframes	125
	Programme-level: baseline and midline evaluation reports, cost-effectiveness analysis, M&E plans, application forms, application assessment sheets and strategy documents	30
	Total	**155**

Survey data

As part of Stage 1b, a GCRF fund-wide survey was developed by the core evaluation team. The main aim of the survey was to quantify the process, mechanisms, early results and achievements that GCRF award holders and DPs have contributed to. The survey aimed to test a selection of core and sub-hypotheses related to these elements. The survey data ensured compatibility with the qualitative analyses from the signature investment process evaluations and alignment to the EQs for Stage 1b.

The award holder fund-wide survey consisted of 39 questions, gathering data from award holders on: General Project Information; Structures and Processes for Project Implementation; Monitoring, Evaluation and Learning (MEL); Achievements; Utilisation of GCRF-Funded Research; Covid-19; and Budget Reductions.[22]

The award holder survey was launched on 20 October 2021 and ran until 19 November 2021. It was sent to approximately 10,472 people across the whole of GCRF, including PIs, Co-Is, researchers, fellows, and others involved in GCRF grants. In total, 3,612 responded to the survey, and there was a total of 67 responses from those affiliated with IPP projects.

2.5 Data analysis

Award-level analysis

Documentation was initially reviewed and categorised as data, context or evidence. All documents categorised as evidence were further coded in MaxQDA using a common codebook structured to reflect EQs.

For the KII data, we analysed the KIIs through the following process:

- First, interview notes were written up into a structured template linking back to the main theme's EQs and criteria. Interview write-ups were then coded using MAXQDA, using the evaluation criteria as the structural codes (see Annex 3 for codebook). Coded interview data was then extracted and analysed for patterns, including similarities and differences in responses by sub-groups of stakeholders.
- Data from award-level interviews and documentation review was summarised in a standardised award-level write-up, which was laid out according to the EQs and evaluation criteria and a set of rubrics. The award write-up template is provided in Annex 3. For EQs 1–4, a tailored rubric assessment was also used to provide a rating

[22] A DP survey was also carried out. This consisted of 21 questions, gathering data from DPs for each of their GCRF programmes on: (i) General Information; (ii) Structures and Processes; (iii) MEL. For the purpose of the GROW process evaluation, only data from the award holder survey was analysed.

for the award's progress in relation to that evaluation question. The rubrics are included in Annex 3. EQs 5–7 did not include a rubric assessment.

- Confidence in evidence was also assessed for each EQ, using a red (low confidence), amber (medium confidence) and green (high confidence) rating, depending on the number of sources, the degree of detail for each source and the consistency among the sources.

Programme-level analysis

Completed award-level write-ups were reviewed and collated into an IPP programme-level write-up. This had the same structure as the award-level write-up, with sections for each EQ and an overall summary of findings for IPP.

The programme analysis template was the main tool used for integrating data from different sources and assessing confidence in the evidence. The analysed data was combined for each EQ and evidence was triangulated to build the evidence base. We used established techniques from qualitative analysis: identifying and interpreting themes, developing explanations, translating emerging themes and explanations back to test against the source data, juxtaposing and exploring contradictory findings, and triangulating findings between the three evidence sources to answer the EQs.

In the programme template, analytical narratives for each EQ were written up, and the supporting evidence was documented. Our confidence in the evidence was then rated as for the award-level write-up. In our analysis of each EQ, we considered how confident we were in the strength of evidence underpinning our judgements. This is based on how strongly the evidence emerges from the individual sources, as well as the degree of triangulation possible between the sources.

As with the award write-ups, the programme-level write-up also included a rubric assessment for EQs 1–4.

Survey data analysis

The entire fund dataset was first prepared for analysis by removing respondents' data who did not provide consent to sharing data and removing 'special category data' from the dataset, specifically data on racial or ethnic origin and disability, meaning that some of these variables will be 'missing data'.

The analysis of survey data was conducted using the Stata statistical software, making use of its large-scale data processing capacity and extensive range of data analysis and visualisation tools. We conducted the following steps of analysis and stratified the data by four signature funds: GROW, IPP, FLAIR and HUBS.

Descriptive univariable analyses were used to describe the sample populations and to summarise all survey measures initially and provide tables of results linked to the hypothesis and sub-hypothesis stratified by signature programmes.

Summary bivariate tables showed the relationships between indicators and grouping variables, including further disaggregation. The typical disaggregation were:

- the respondents' country of origin – classified as LIC, HIC or UK
- the position of the respondent as a 'primary or secondary' researcher.

2.6 Limitations of our approach

Some awards were represented with only a small number of interviews. For some awards within the sample, we were able to undertake only a small number of interviews offering a limited perspective. In addition, because of the large consortium size within IPP, interviewees were not always aware of all the aspects of the award and could speak only to certain elements within it. Furthermore, individuals had sometimes left the organisations and their replacements were not always aware of aspects of the project that had occurred at its inception. Despite this, the extensive documentation meant that this was mitigated through the document review where possible.

There was limited representation of Southern partners. The evaluation design specified PI and Co-I respondents, which limited representation of Southern partners in the interviews. This meant that the interviewee insights gathered were primarily from the UK partners.

It was not possible to interview unsuccessful applicants. The original ToR envisioned that the evaluation would be able to speak to unsuccessful applicants. In practice, we were advised by DPs that this will be difficult to achieve, mainly due to General Data Protection Regulation (GDPR) restrictions that mean that DPs do not have permission to hold contact information for and contact unsuccessful applicants for evaluation. From a resource perspective, addressing these barriers did not seem cost-effective, so unsuccessful applicants are deemed out of scope.

3 Findings

This section describes the findings against the seven EQs for UKSA's IPP, to answer the overarching evaluation question 'How well are GCRF's investments working and what have they achieved?'

3.1 EQ 1: To what extent are structures and processes in place to support challenge-led R&I with development impact, within signature investment awards and programmes?

Box 4. Summary – to what extent are structures and processes in place to support challenge-led R&I with development impact, within signature investment awards and programmes?

The IPP programme and awards showed a good range of structures and processes that align well with challenge fund good practices and strengthened the potential for excellent ODA R&I in the IPP awards. These included the following:

- **ToC and shared vision.** IPP has a detailed ToC which maps programme activities to the UN SDGs and has been actively used during programme implementation **commissioning and selection of portfolio**. IPP has clear and detailed processes to commission research, aligned to the challenges faced by developing economies.
- **Programme management.** Management of IPP has been adaptive and well received, although greater 'hands-on' involvement would be welcomed by award holders.
- **M&E.** IPP has extensive M&E processes that have been implemented at both programme and project levels and these have informed programme implementation.
- **Positioning for use.** Through varying engagement mechanisms IPP supports the implementation and uptake of research.

Our approach to answering the EQ

EQ 1 focuses on the structures and processes that we would expect to see in terms of managing challenge-led ODA R&I at both programme and award levels and in terms of implementation for excellence in ODA R&I. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the evaluation question for IPP, we focused on the following criteria:

Our findings against the IPP-specific structures and processes are discussed below.

- ToC and shared vision
- Commissioning and selection of the portfolio
- Hands-on programme management
- M&E
- Positioning for use.

3.1.1 ToC and shared vision

IPP has a detailed ToC which maps programme activities to the UN SDGs and has been actively used during programme implementation. IPP has a detailed ToC,[23] which maps programme activities – through outputs and outcomes – to measurable and sustainable economic or societal benefits, using the UN SDGs as a framework.[24] This framing supports alignment of IPP against GCRF aims, as the GCRF ToC explicitly targets achievement of SDGs. The ToC has been an active document, with the team refreshing the document following the IPP Baseline Evaluation.[25]

The IPP awards have individual ToCs; however, awareness of them is patchy, raising questions over how they have been used. Each IPP award has a detailed ToC and was developed with inputs from the consortium, UKSA and other key stakeholders.[26] Award-level ToCs are aligned to the broader programme ToC by using common indicators where possible.[27] 82.1% of award holders stated that their project had clearly defined targets and objectives linked to development goals (**Error! Reference source not found.**).[28] There is, however, an indication that not all award holders are aware of the project-level ToCs: 79.1% of award holders stated that their project had a project-level ToC or impact strategy.[29] This is perhaps unsurprising, given the large consortium sizes of IPP awards and the substantive role that project leads play in project design and M&E activities. Although ToCs are relevant to the overall framing of the project, this also demonstrates that the ToC might not be integral to project operation, provided there is a good project management approach that can effectively communicate project needs to all partners involved. There were efforts to ensure that awards had common indicators based on thematic themes (for example around forestry). This supported M&E at programme level.

Figure 5: Percentage of IPP survey respondents who reported a programme level ToC, and clearly defined targets and objectives.

[23] IPP M&E Plan 2021 Final.

[24] IPP-P4.

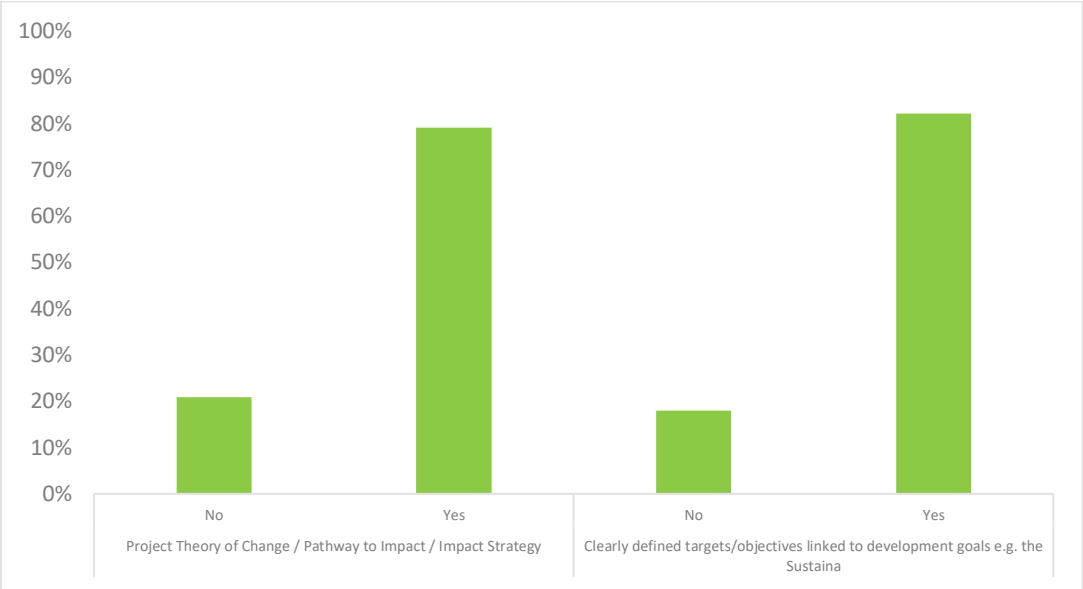
[25] IPP-P4

[26] EASOS Analysis Table, RE-SAT Analysis Table, Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table, OASIS-TU Analysis Table, PASSES Analysis Table, SatDRR Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, CommonSensing Analysis Table, Mexican COMPASS Analysis Table, Space-based dam monitoring (DAMSAT) Analysis Table.

[27] EASOS Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[28] GCRF evaluation survey of award holders.

[29] GCRF evaluation survey of award holders.



Source: GCRF Evaluation, fund-wide survey 2022

3.1.2 Commissioning and selection of portfolio

IPP has clear and detailed processes to commission research, aligned to the challenges faced by developing economies. The scope of the IPP calls is defined by the IPP team (UKSA with support from Caribou Space), head of programme, and the Steering Board.[30] Calls have developed as the programme has evolved; learning has been used from previous calls to guide later ones. For example, the legacy evaluation of one of the projects within Call 1 (EASOS) described the need for a 'discovery' or 'inception' phase.[31] An initial 'pilot' phase was brought into some Call 2 projects,[32] and with Call 3 a formal 'discovery' phase was introduced. The discovery phase was also proposed to support end user engagement throughout the project and to positively impact sustainability (something which was difficult in previous calls).[33] Unfortunately, due to the funding cuts, Call 3 calls did not reach the 'implementation phase' of their awards, and therefore the full impact of introducing a discovery phase cannot be measured. However, interviewees from Call 2 projects which had introduced a pilot phase were complimentary of this approach.[34]

All projects approved under IPP must be ODA-compliant and are checked against ODA criteria.[35] The application process is open to a broad range of UK organisations provided that they partnered with an international partner and targeted a country on the DAC list.[36] To support applicants with the process, applicants are provided with detailed guidance on IPP and the requirements involved in applying for funding.[37] IPP ran applicant workshops in the lead-up to proposal submission, to support the process.[38] Following submission, each proposal is reviewed by individuals from UKSA and Caribou Space as well as independent assessors – from

[30] IPP-P5, IPP-P6.

[31] EASOS Analysis Table.

[32] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[33] IPP-P5.

[34] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[35] UKSA IPP Brochure.

[36] IPP-P6, IPP-P7.

[37] IPP Call 2 Application Guidance.

[38] IPP-P7.

academia, government or the private sector – who have sector or technical expertise.[39] Following these assessments, a panel review meeting allowed for proposal scores to be discussed and moderated. Criteria for proposal selection included alignment to programme aims, viability, VfM and cost-effectiveness and M&E strategy, and identified international partnership and end user engagement.

The IPP commissioning process considers how projects target specific development challenges, including relevance, coherence and GESIP. Here we review the treatment of these development considerations within the commissioning process.

3.1.2.1 Relevance to local needs

During the commissioning process, IPP assesses projects to ensure they are relevant to local needs. The application process requires that projects demonstrate relevance to local needs, with explicit criteria relating to the potential impacts on the target country.[40] During proposal assessment, the relevance of the technical solution to user needs is critically assessed, including whether the space solution is more effective than a terrestrial alternative and most appropriate to answering the development challenge under consideration.[41] Awards demonstrated relevance to local needs in varying ways, through linkages to policy priorities and targets as well as through the positive impact that awards could have in terms of supporting countries to face environmental or development challenges.[42]

Analysis of awards demonstrates that, on the whole, IPP projects have remained relevant to local needs. 93.8% of award holders agreed or strongly agreed with the statement that their project was relevant to communities within the target country.[43] Continued engagement between the IPP team and award holders post-award is likely to have supported this. Post-award, all IPP projects conduct baseline evaluations which enable teams to further explore the wider context and relevance of the awards, bringing in additional knowledge and up-to-date information where relevant, and engaging with stakeholders to determine how the technical solutions will be used in context.[44] Wider stakeholder consultation was prominent within IPP, with 79.1% of award holders stating that external organisations and stakeholders were consulted – including international and national non-governmental organisations (NGOs), national and sub-national governments, public sector organisations, local community representatives and multilateral organisations[45] – supporting relevance. Despite these efforts, there was variation in whether awards succeeded in remaining relevant to local needs, with project evaluations highlighting differences. The endline evaluation for the COMPASS project found strong and continued support for the rationale behind the project,[46] whereas the evaluation of the OASIS-TU project found that there was reluctance by end users to engage with the tool.[47]

3.1.2.2 Coherence

[39] IPP-P7, IPP-P4, IPP-P6.

[40] IPP Call 1 guidance, Assessment sheet for Caribou IPP Call 3.

[41] IPP-P3, IPP-P11, Assessment Sheet for IPP Call 2 Independent Assessors.

[42] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, EASOS Analysis Table.

[43] GCRF Evaluation survey of award holders.

[44] RE-SAT Analysis Table, EASOS Analysis Table.

[45] GCRF Evaluation survey of award holders.

[46] Mexican COMPASS Analysis Table.

[47] OASIS-TU Analysis Table.

There have been efforts to make the IPP portfolio coherent and ensure alignment with the programme's aims, although more support is needed to ensure alignment with GCRF. IPP's primary aim is to delivery economic or societal benefits to its beneficiaries, and as all commissioned IPP projects target a UN SDG, this ensures coherence with this overarching aim.[48] In terms of the commissioning of individual projects, awards were assessed individually on their quality, and therefore coherence across awards within a single call was not explicitly considered. However, there were efforts at programme level to ensure coherence, through mapping awards to countries, sectors, SDGs and GCRF challenge areas, and through taking action to include underrepresented areas through targeted calls.[49] In terms of coordination at GCRF level, the evidence suggests that there was limited opportunity for coordination and collaboration across the fund,[50] and more input and guidance from BEIS would have been welcomed.

IPP aims to ensure coherence with the wider development landscape. IPP aims to ensure coherence with the wider development landscape, and a concerted effort was made to ensure that there was not duplication with what others were doing in the aid space. The IPP team had conversations with relevant stakeholders, such as DFID (now FCDO), to understand the landscape.[51] UKSA have also tried to create synergies where possible with other organisations, for example through collaboration with the Met Office.[52] Individual awards had also attempted to ensure alignment with wider development strategies. For the expansion of the EASOS tool, synergies were explored with consortia of existing programmes and there was alignment to the strategies of BEIS, the Department for International Trade (DIT) and UKSA where appropriate.[53] The midline evaluation concluded that relationships between UKSA and DFID (now FCDO) could be further strengthened to bring expertise into IPP and support project implementation.[54] Furthermore, sustainability and knowledge and communication plans developed by projects also supported awards in thinking about their project within the context of the wider development landscape.

3.1.2.3 Gender equality

Gender was not adequately addressed in the early phase of IPP; however, important efforts have subsequently been made to integrate gender explicitly into project design and implementation. Gender equality has become an increasingly important aspect of IPP as the programme has evolved.[55] Call 1 projects were not asked to consider gender equality in proposals, and therefore it was not a consideration within the project design. However, over Calls 2 and 3 there have been increasing efforts to address gender equity, with Call 3 proposals asked to explicitly reference potential impact on gender equity.[56] This is reflected in the survey analysis: only 35.7% of award holders stated that they had a gender and inclusion plan as part of the project, and only 9% stated that they had received expert advice on gender and inclusion from the funding organisation. However, it should be noted that the IPP team is in contact with the lead organisation – as opposed to in-country stakeholders and other

[48] EASOS Analysis Table, RE-SAT Analysis Table, Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table, OASIS-TU Analysis Table, PASSES Analysis Table, SatDRR Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, CommonSensing Analysis Table, Mexican COMPASS Analysis Table, Space-based dam monitoring (DAMSAT) Analysis Table.

[49] Input to IPP Strategy_2018_07_02 Final V1.

[50] IPP-P5.

[51] IPP-P5, IPP-P4.

[52] IPP-P5.

[53] EASOS Analysis Table.

[54] IPP Midline Evaluation V3_Projects_FINAL.

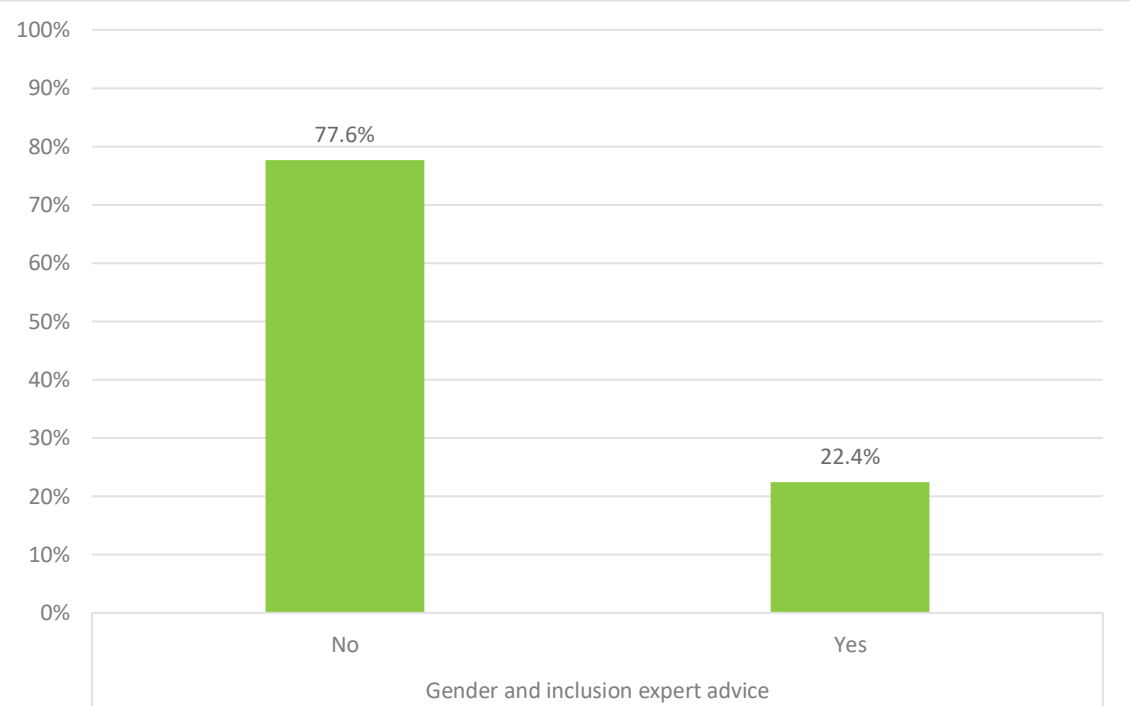
[55] 3. IPP Call 3 Application Guidance, IPP-P2, IPP-P4.

[56] 3. IPP Call 3 Application Guidance.

consortium partners – and therefore information around considerations such as gender may have been passed onto the lead organisation but might not have filtered down to other organisations involved in implementation. When considering the application process, one interviewee did highlight that gender equity was less of a consideration when thinking about the applicants, as applications were put forward by organisations as opposed to individuals. Future IPP calls could consider also asking for a gender equality statement from the organisation itself.[57] The increasing focus of gender was documented within the IPP Strategy Note for Incorporating a Gender Equality Approach, which highlighted the importance of including gender equality, as well as recommendations for how gender can be further integrated into project design and implementation.[58]

Gender has also been brought into the M&E activities of IPP, with explicit reference to Gender in the IPP M&E handbook, including expectations around monitoring and reporting activities (e.g. the collection, reporting and analysis of gender-disaggregated data) and that project evaluations should include specific reference to how the project has impacted on gender.[59] Although gender has become an increasing component of IPP as the programme has progressed, there are examples of awards in the earlier calls that have considered gender in terms of the end users of tools,[60] capacity building activities[61] and the composition of project structures such as Steering Committees.[62]

Figure X: Percentage of IPP survey respondents who reported receiving gender and inclusion expert advice



Source: GCRF Evaluation, Fund-wide survey 2022

3.1.2.4 Poverty and social inclusion

[57] IPP-P3.

[58] Gender Equality Strategy.

[59] IPP M&E Handbook.

[60] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[61] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, RE-SAT) Analysis Table, CommonSensing Analysis Table, DAMSAT write-up.

[62] CommonSensing Analysis Table.

IPP calls have not explicitly focused on poverty and social inclusion, but nonetheless some IPP projects have targeted these aspects through the focus of their award. The majority of IPP calls were open, and therefore projects were not made to target specific areas of focus. 10 IPP projects have targeted SDG 1: No Poverty.[63] This has primarily been through developing tools and technologies to support countries in disaster resilience – for example EASOS, which was used in Malaysia to predict and model floods, and the Satellite Communications project, which developed tools to support tracing and identification in the aftermath of natural disasters.[64] Although there is no single SDG focused specifically on social inclusion per se, several are linked to providing a fairer and more inclusive society, including SDGs 10: Reduced inequalities, 5: Gender equality, 4: Quality Education and 8: Work and Economic Growth.[65]

3.1.2.5 Interdisciplinarity

IPP projects have adopted an interdisciplinary approach through the project teams and proposed research, although this could be expanded further. At the application stage, proposals were required to demonstrate that the team had integrated relevant expertise and existing data available on the subject matter, as well as information from local partners where relevant.[66] The EASOS award brought together partners with different technical expertise in utilising satellite data, data visualisation, data analysis, Geographic Information System and modelling techniques, as well as a sectoral understanding of forestry and marine pollution.[67] Similarly, the lead agency for RE-SAT was part of the university and therefore was able to draw relevant expertise from the institute, and awards such as RE-SAT and Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire had expertise in stakeholder engagement.[68] As stated above, projects consulted external stakeholders to gather input. Award-holders stated that external organisations and stakeholders were consulted, including international and national NGOs, national and sub-national governments, public sector organisations, local community representatives and multilateral organisations (**Error! Reference source not found.**). It was noted, however, that project teams could still be heavily technical and that further inclusion of stakeholders with expertise in development or gender equality would have been beneficial during project implementation.[69]

[63] IPP Midline Evaluation V3_Projects_FINAL.

[64] IPP Midline Evaluation V3_Projects.

[65] IPP Midline Evaluation V3_Projects.

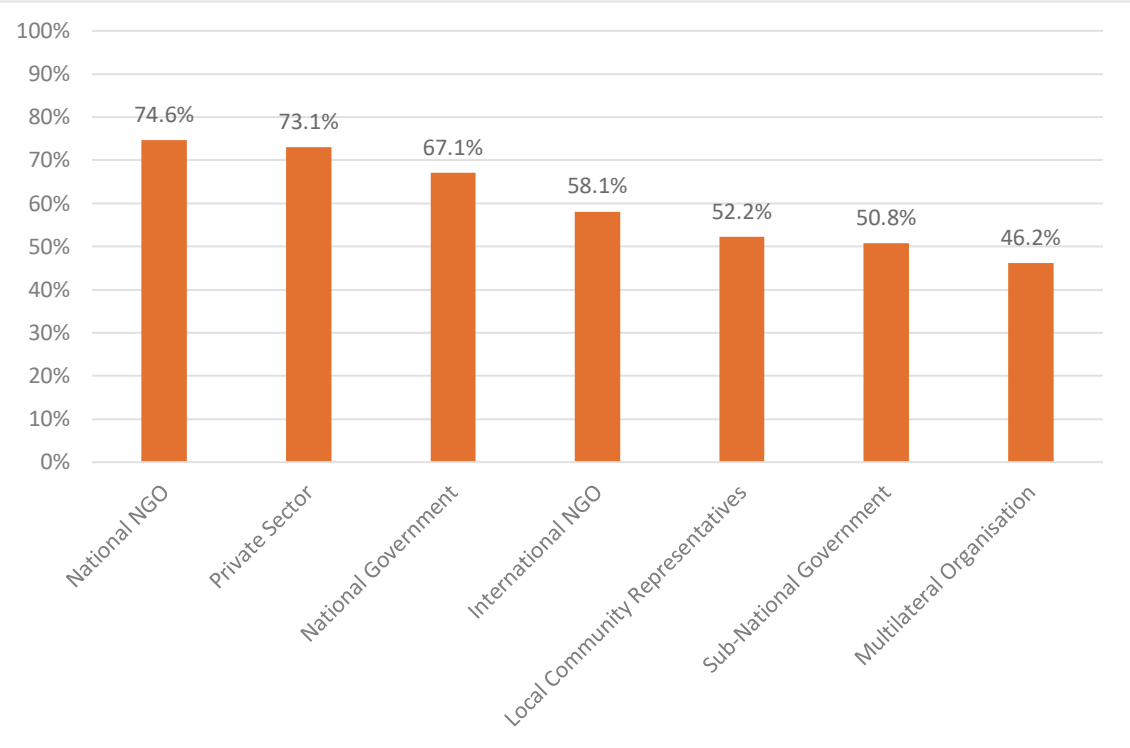
[66] IPP-P10.

[67] EASOS Analysis Table.

[68] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[69] EASOS Analysis Table.

Figure 5: Percentage of IPP survey respondents who reported consultation with external stakeholders



Source: GCRF Evaluation, fund-wide survey 2022

3.1.2.6 Negative consequences mitigated

IPP required project teams to think explicitly about risks during both the design and delivery of the project, with evidence suggesting that this was successful. During the application process, as part of the written proposal, teams were asked to consider the potential risks of the project.[70] These risks varied depending on the proposal, but included aspects such as risks around failure to deliver, risks around engagement in country, or risks around misuse or misunderstanding of the information. At the start of projects, project teams were supported with thinking about potential negative consequences of their award,[71] and project teams maintained risk registers.[72] Where possible, mitigations or alternative methods were identified. Mitigations for awards included ensuring appropriate market research,[73] extensive stakeholder engagement and collaboration,[74] ongoing monitoring and the use of learning logs documenting lessons learned as well as 'near misses' to support effective project management and implementation.[75] 72.6% of award holders agreed or strongly agreed that potential negative consequences of their project were identified and mitigated.

3.1.3 Hands-on programme management

Programme management of IPP has been adaptive and well received, although greater 'hands-on' involvement would support project delivery. The IPP midline evaluation concluded

[70] IPP-P9, IPP-P10, IPP-P1.

[71] IPP-P1.

[72] RE-SAT Analysis Table.

[73] EASOS Analysis Table.

[74] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, DAMSAT write-up.

[75] RE-SAT Analysis Table.

that programme management by UKSA had been adaptive and generally well received.[76] The IPP team were considered to respond quickly to queries and had a good relationship with the project lead organisations. It was suggested that the flexibility displayed by UKSA to suggestions and changes, especially on M&E, ensured efficiency.[77] The IPP team also played an important role in facilitating in-country relationships (see Section on enablers for further information). There was also oversight of IPP by the Steering Board;[78] members of the Steering Board were involved in the early stages of programme design and were involved in oversight of the programme as it continued.[79] In addition, the strong focus on M&E activities – supported by Caribou Space – was perceived as a valuable and unique aspect of IPP (see Section on M&E for further information).[80] At the midline evaluation there were some findings related to improving management: it was concluded that the UKSA team could further support projects by providing greater technical and sectoral expertise and more 'hands-on' management.[81] This was supported by survey findings: only 13.5% of award holders stated that they received technical research advice from the funding organisation, and only 17.9% stated that they had received support with research design (Error! Reference source not found.). These findings may also be indicative of the fact that the lead organisation handled the interactions with UKSA. Furthermore, in terms of financial support, the evidence was mixed as to whether this was adequate for the project: only 55.2% of surveyed award holders felt that the funding was sufficient.

Figure 6: Percentage of IPP survey respondents who reported receiving support from IPP

[76] IPP Midline Evaluation V3_Projects_FINAL.

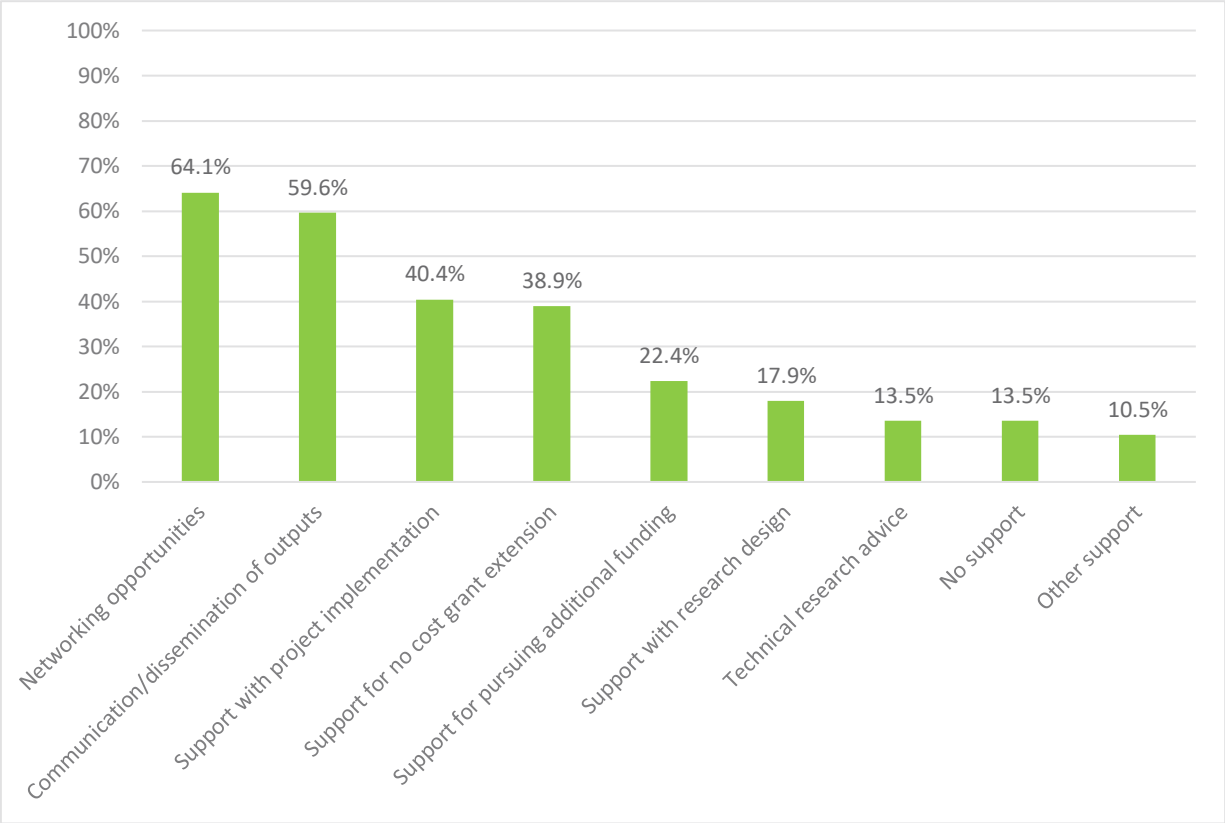
[77] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[78] Steering board representatives listed here: https://www.gov.uk/government/organisations/uk-space-agency/about/our-governance#steering-board

[79] IPP-P11.

[80] IPP Midline Evaluation V3_Projects_FINAL.

[81] IPP Midline Evaluation V3_Projects_FINAL.



IPP supported coherence across award holders through networking events and knowledge exchange, although more opportunities would be welcomed. There have been efforts to coordinate award holders internally within the programme.[82] This has been done through seminars and annual conferences to promote relationships between award holders. This appeared to differ across awards, with some stating that this had been limited (although still useful), while others – such as within EASOS – stated that synergies had been explored between their award and others within IPP to expand the tool with the technical component applied to other IPP platforms.[83] In addition, an IPP newsletter shares information across the award holders and more broadly.

Although positive overall, more opportunities for networking and coordination would be beneficial. The midline evaluation concluded that coordination across award holders could be developed further for increased effectiveness, through mechanisms such as thematic and geographically themed meetings.[84] 64.1% of survey respondents stated that IPP had supported networking opportunities, indicating that there is still room for improvement (Figure 7:), and interviewees across awards felt that there was limited opportunity for other members of the consortia to network or build relationships.[85]

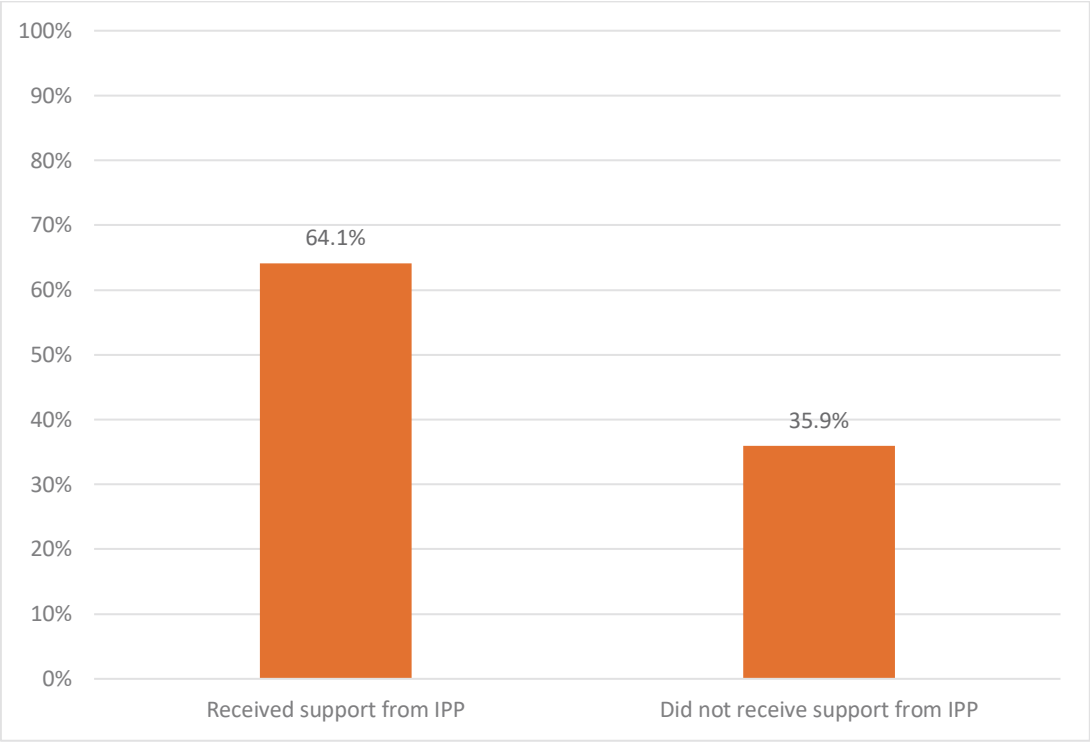
Figure 7: Extent of IPP support to award holders with networking opportunities

[82] IPP-P4, IPP-P5.

[83] EASOS Analysis Table.

[84] IPP Midline Evaluation V3_Projects_FINAL.

[85] EASOS Analysis Table, + CHS write ups



Source: GCRF Evaluation, fund-wide survey 2022

3.1.4 M&E

IPP has extensive M&E processes and these have informed programme implementation. M&E is considered an important and unique aspect of IPP, and IPP has implemented extensive processes at both programme and project levels. Each individual award has a dedicated M&E work package and M&E budget.[86] In addition, each award must produce an M&E plan with a detailed project-level ToC at the start of the project. Awards undertake regular monitoring and reporting processes such as monthly and quarterly progress reports to inform on project progress and spending.[87]

In terms of evaluation, awards undertake baseline, midline, endline and cost-effective evaluations (CEA) as the project progresses. Some awards, such as EASOS, have also conducted legacy evaluations to explore potential impacts of the project after the funding period. At the individual award level, evaluations may be conducted by the project consortium or by independent evaluators.[88] The evaluation of EASOS was conducted by an external evaluation agency and used a mixture of data sources, including document review, monitoring data, interviews, survey and focus groups to gather evidence and triangulate findings.[89] 49.2% of award holders stated that their project had been subject to an external evaluation and that the evaluation recommendations had been communicated and implemented. For the Deforestation prevention with land use monitoring and evaluation in Côte d'Ivoire award, the

[86] EASOS Analysis Table, RE-SAT Analysis Table, Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table, OASIS-TU Analysis Table, PASSES Analysis Table, SatDRR Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, CommonSensing Analysis Table, Mexican COMPASS Analysis Table, Space-based dam monitoring (DAMSAT) Analysis Table.

[87] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[88] EASOS Analysis Table, RE-SAT Analysis Table.

[89] EASOS Analysis Table.

baseline evaluation provided a chance for the project team to revise the monitoring indicators for the project and update them to better align with the focus.[90]

Project-level M&E is integrated at programme level, and IPP undertakes baseline, midline and endline evaluations of the programme, evaluating both the programme processes and outcome/impact indicators. Learning from the evaluation processes has been implemented as the programme has evolved. For example, the midline evaluation captured a series of lessons learned and recommendations, which have been taken forward in the second stage of the programme. In addition, between each IPP call there is adaptation and learning from the previous call. Caribou Space also provide annual strategy updates to UKSA, to offer reflections on what has been working well and where there is room for improvement. In the 2018 strategy review, IPP projects mapped against GCRF challenge areas were highlighted and gaps were demonstrated as well as recommendations for targeted future calls.[91] IPP also produces public-facing versions of their evaluation reports so that learning can be spread more widely.[92]

The M&E methodology broadly follows the Magenta Book, the UKSA evaluation strategy and best practice from DFID and OECD DAC guidance.[93] The M&E processes are supported by Caribou Space, an external organisation with expertise in M&E.

Overall, interviewees have been positive about the M&E involved in IPP. They stated that the processes had helped to understand the impact of the project and provided opportunities to strengthen their relationship with stakeholders in the country through communication and feedback.[94] The cost of M&E processes varied across the awards. At the proposal stage approximately 3%–9% of the total award budgets was allocated for M&E activities. However, it was noted in the midline evaluation that projects, particularly in Call 1, underestimated M&E costs, as the M&E requirements continued to evolve as the programme developed.[95]

3.1.5 Positioning for use

To support positioning for use, IPP stipulated that all award holders had to develop a knowledge and communication plan. This plan identified communication needs, mechanisms for communication and relevant stakeholders and supported awards to undertake targeted communication activities.

3.1.5.1 Engagement with in-country stakeholders and end users

Engagement with in-country stakeholders and end users was a priority for IPP awards, although the degree to which this was done varied across awards. Communication with local users was a priority for several IPP projects; 74.9% of award holders agreed or strongly agreed with the statement that the project had specific plans to optimise the local practical use of knowledge.[96] This was facilitated by stakeholder mapping[97] and support from UKSA to explore in-country opportunities.[98] Awards varied in the extent to which they travelled to the target country/region, and interviewees suggested that more frequent travel by the UK partners to

[90] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[91] Input to IPP Strategy_2018_07_02 Final V1.

[92] International Partnership Programme: A Summary of the IPP Midline Evaluation. https://www.gov.uk/government/publications/international-partnership-programme-a-summary-of-the-ipp-midline-evaluation

[93] Input to IPP Strategy_2018_07_02 Final V1.

[94] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[95] IPP Midline Evaluation V3_Projects_FINAL.

[96] GCRF Evaluation survey of award holders.

[97] See, for example, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[98] IPP-P5.

the country was beneficial for strengthened engagement.[99] The RE-SAT project implemented a detailed 'pilot' phase which included field visits, in-depth consultations and engagement with in-country stakeholders, which supported relationship building and allowed the team to define data requirements and intended impacts for the project.[100] This close engagement supported updates to the tool.[101] Despite positive efforts, the need for substantial engagement with stakeholders in-country and a thorough understanding of the in-country context was raised as a barrier to IPP awards; for further discussion please see EQ 5 on barriers and enablers.

3.1.5.2 External engagement and dissemination

IPP awards had dedicated work packages targeting knowledge sharing and communication, and the packages supported these activities in practice. Within their design, IPP awards had dedicated work packages to support external engagement, including with stakeholders such as commercial users, NGOs, national governments and potential donors. These activities supported projects to promote their expertise and capability in addressing development challenges,[102] as well as supporting sustainability of the tool through engagement activities to determine new countries or sectors that the technical solution could be applied to.[103] There is, however, evidence that more could be done. Only 60% of award holders indicated that there had been communication and dissemination of project outputs.[104]

The IPP programme team have made significant efforts to communicate the activities within the programme. IPP has several mechanisms to support the dissemination and communication of research undertaken by awards, including a dedicated website for IPP projects,[105] a newsletter, case studies on individual awards,[106] and reports on the importance of space across different sectors, such as forestry, agriculture and disaster resilience.[107]

3.2 EQ 2: To what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?

Box 5. Summary – to what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?

Capacity building for LMIC partners was approached in different ways in IPP, depending on the aims of the award, and there was no explicit programme-level capacity building strategy. Capacity building was focused fairly narrowly on technical skills building to operate tools, with some examples of improved decision-making capacity in some organisations. Assessments of changes in capacity were rather superficial, although data was disaggregated by gender, which was a strength.

[99] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[100] RE-SAT Analysis Table.

[101] RE-SAT Analysis Table.

[102] IPP Midline Evaluation V3_Projects_FINAL.

[103] RE-SAT Analysis Table, EASOS Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[104] GCRF Evaluation survey of award holders.

[105] https://www.spacefordevelopment.org/

[106] For example, see EASOS: Earth and Sea Observation System (IPP Case Study). https://www.spacefordevelopment.org/library/easos-earth-and-sea-observation-system-ipp-case-study/

[107] Space for Agriculture in Developing Countries. https://www.spacefordevelopment.org/library/space-for-agriculture-in-developing-countries/; Space for Disaster Resilience in Developing Countries. https://www.spacefordevelopment.org/library/space-for-disaster-resilience/; Space for Forestry in Developing Countries. https://www.spacefordevelopment.org/library/space-for-forestry-in-developing-countries/

- **In-country capacity building.** Almost all awards had capacity building as a stated objective, and this varied in the form and extent to which it was achieved. Capacity building could be challenging for awards, and award holders were not always prepared for the level of in-country capacity building that was required.
- **Assessment of capacity building within IPP.** Efforts were made to assess changes in capacity through different methodologies, some more systematic than others. Capacity building was assessed at both programme and award levels, although the degree to which this was undertaken varied across awards. This included assessment of individuals attending capacity building activities, with more detailed assessments comparing capacity before and after training.
- **Capacity building in the UK.** Positive changes in UK capacities were noted, although these were not specifically a target of the awards.

Our approach to answering the EQ This section focuses on the structures and processes that we would expect to see in terms of strengthening R&I capacity in LMICs and within the UK. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the EQ for IPP, we focused on the following criteria:

- Capacity building activities in LMICs
- Assessment of capacity building
- Capacity building activities in the UK.

Our findings against the IPP-specific structures and processes are discussed below. The findings indicate that the degree to which capacity building objectives were achieved is mixed. The findings also show that the assessment of capacity building activities only occurred at award level; the counting of people participating in capacity building events at the programme level is not sufficient evidence to make a judgement about improved capacity. There is some evidence of improved capacity in the UK as a result of IPP.

3.2.1 In-country capacity building

Capacity building was a stated objective of almost all awards and it took various forms. The degree to which capacity building objectives were achieved was mixed.

Capacity building activities varied across IPP. For some awards, this involved delivering technical knowledge, such as training in geographic information systems (GISs) or Earth observation, or in mainstreaming physical hardware and data cubes.[108] In cases where awards developed platforms, apps or dashboards, capacity building involved showing in-country partners how to use these platforms.[109] One example of this is the EASOS award, in which Malaysian stakeholders received training to enable ongoing operation and control of a dashboard that provides real-time information and alerts on flooding, marine pollution and deforestation.[110] In other cases, capacity building was delivered in the form of workshops, user exercises, user manuals, and secondments.[111]

[108] IPP-P1.
[109] IPP-P6.
[110] EASOS Analysis Table.
[111] IPP-P2.

Capacity building was achieved primarily at award level rather than at programme level.[112] In some cases, the technical tools developed strengthened capacity of the institutions to improve decision making or policymaking.[113]

Award-holders were not always prepared for the level of in-country capacity building that was required. Many projects had to conduct more basic skills training than they had expected,[114] and in some cases in-country individuals asked for further training.[115] One factor that may explain this is that UK primes were typically from technical firms in the satellite industry and not necessarily knowledgeable about on-the-ground training and capacity development.[116] This reflects the need for a more interdisciplinary approach, as discussed in Section 4.1.2. As discussed in Section 4.4, there were also limitations around the technical capacity in-country, such as the hardware needed to support the tools, Internet connectivity and infrastructure.[117] One of the lessons learned from this is that it is important to assess the baseline capacity of partners, to help ensure that training is adequately tailored to in-country needs.[118] Some awards did attempt to do this by using the baseline evaluations to assess capacity gaps and needs.[119]

3.2.2 Assessment of capacity building

Capacity building was only assessed at award level. At programme level, the number of people participating in capacity building events was used as a proxy for increased capacity building. However, the number of people participating in capacity building events is not sufficient evidence to make a judgement about improved capacity. It was noted, for example, that at programme level, the number of individuals with increased capacity to use satellite-enabled solutions due to IPP was 2,579 in 2019, projected to reach 4,000 in 2021.[120] The figures used to assess capacity building at programme level were disaggregated by gender; out of the 2,579 individuals in 2019 who had participated in capacity building events, around 850 were women.[121] This does not capture baseline capacity or the extent to which capacity improved through training, and as such may provide an incomplete or inaccurate picture of capacity building.

This was often the case at award level as well, with metrics such as workshop attendance being used to assess capacity building. For example, the award on preventing deforestation in Côte d'Ivoire noted that technical workshops were well attended, and that by the midline evaluation 98 people and 18 organisations had attended the workshops – exceeding the project's target of 40 people and 5 organisations by endline.[122]

However, three out of the ten awards took a more detailed approach that assessed baseline in-country capacity and compared this to capacity after training. The SatDRR project, for example, noted that at baseline, 20% of key informants reported familiarity with Earth observation, whereas at the endline this was 95%. The project also found that none of the key informants interviewed at baseline reported familiarity with satellite communication,

[112] IPP-P1.

[113] See, for example, RE-SAT Analysis Table and EASOS Analysis Table.

[114] IPP Midline Evaluation V3_Projects_FINAL.

[115] IPP-P6.

[116] IPP-P2.

[117] CommonSensing Analysis Table, Mexican COMPASS Analysis Table.

[118] IPP Midline Evaluation V3_Projects_FINAL.

[119] RE-SAT Analysis Table.

[120] UK-Space-Agency-IPP-Midline-Evaluation.

[121] IPP Midline Evaluation V3_Projects_FINAL.

[122] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

compared to 83% at the endline.[123] However, increased familiarity did not correlate directly with usage for this project; at baseline 0% of key informants reported using Earth observation in disaster management processes, while at endline this was 20%.[124] Furthermore, the legacy evaluation of EASOS noted that capacity building around the SDG technologies was limited.[125] For some projects capacity building was assessed qualitatively through feedback from stakeholders.[126]

3.2.3 Capacity building in the UK

Some award holders noted that the award had a positive impact on UK capacity. Some awards noted that UK capacity also increased as a result of the award. This tended to include building of softer skills, including working with developing countries, working on development issues, skills in stakeholder engagement, and skills in M&E as well as project management and communication. For example, the Forests 2020 project described the importance of learning about in-country forest sectors, including different definitions of forests and the political dimension of such definitions. The team discovered that Mexico has over 50 different definitions of forest types, based on factors such as height of trees, tree cover and land use.[127] While some of these can be ascertained through remote sensing, some cannot – and in this way, this knowledge contributed to UK capacity. Similarly, the project on deforestation prevention in Côte d'Ivoire found that the award had a positive impact for the team in terms of building capacity and skills in spatial data as well as building team confidence, which helped the team in other projects they have gone on to work on.[128]

3.3 EQ 3: To what extent are processes [to support challenge-led research] efficiently implemented, are they proportionate for UK and LMIC stakeholders, timely and do they offer value for money?

Box 6. Summary – To what extent are processes to support challenge-led research efficiently implemented, proportionate, timely and do they offer value for money?

IPP was effective in establishing processes that were seen as proportionate, with efforts made to promote fairness in partnerships and sustainability of projects. Dedicated processes to deliver VfM were a strength and enabled reliable cost-effectiveness judgements.

Proportionality of the processes. IPP processes to support challenge-led research were generally considered proportionate to the size of the fund, although M&E activities were considered high.

Efficiency and timeliness of processes. IPP processes to support challenge-led research were generally considered efficient, and flexibility was valued by award holders.

VfM. IPP has established processes to support projects in delivering VfM, and projects were demonstrated to be cost-effective when compared to non-space alternatives.

Fairness of processes. IPP projects involved consortia of UK and in-country partners, although greater involvement of in-country stakeholders was suggested as beneficial for future awards.

[123] SatDRR Analysis Table.

[124] SatDRR Analysis Table.

[125] EASOS Analysis Table.

[126] Examples included RE-SAT Analysis Table and Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[127] Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[128] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

Sustainability of the projects. IPP aims to promote project sustainability to ensure that the benefits of the project continue after the lifetime of the fund; however, projects continued to find this challenging.

Our approach to answering the EQ

EQ 3 focuses on to what extent the structures and processes are efficiently implemented, proportionate and timely and offer VfM. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the EQ for IPP, we focused on the following criteria:

- Proportionality of processes
- Efficiency and timeliness of processes
- VfM
- Fairness of processes
- Sustainability of the projects.

Our findings against the IPP-specific structures and processes are discussed below.

3.3.1 Proportionality of processes

IPP processes to support challenge-led research were generally considered proportionate to the size of the fund. In terms of the application processes, one interviewee felt that compared to other funds – such as from the European Space Agency – the efforts needed from award holders were low.[129] In addition, the proposal review processes were considered proportionate and appropriate to the size of the awards while also ensuring due diligence.[130] In terms of the M&E processes, interviewees generally felt that they were proportionate.[131] However, it was highlighted that some award holders did find the M&E processes high, although this might be expected given that the fund is an ODA fund as opposed to technology development alone.[132] It should also be noted that there were some differences across stakeholder type, with sub-grantees feeling that processes were disproportionately high compared to the proportion of funding they received.[133]

3.3.2 Efficiency and timeliness of processes

IPP processes to support challenge-led research were generally considered efficient. Overall, IPP processes – application/review processes, oversight and M&E – are considered efficient[134] and relatively light-touch.[135] However, some award holders may have preferred a closer engagement with programme management, as well as increased scrutiny and oversight of their award to promote effectiveness.[136]

However, timeliness was an issue, with some delays highlighted. Just under a third of surveyed award holders felt that the funding was not timely, and many projects experienced some delays in their processes. Delays resulted from a range of factors, including delays in exporting

[129] IPP-P3.

[130] IPP-P10, IPP-P7.

[131] IPP-P3, IPP-P6.

[132] IPP-P6, IPP-P3, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[133] CommonSensing Analysis Table.

[134] IPP-P6, IPP-P3, IPP-P7, IPP-P1.

[135] IPP Midline Evaluation V3_Projects_FINAL.

[136] IPP Midline Evaluation V3_Projects_FINAL.

hardware to partner countries[137] and lengthy processes for contracting and for grant change notices, which were highlighted as bureaucratic and time-consuming.[138] However, though the process was slow, the flexibility offered to allow changes in grants was considered a strength of IPP.[139] Logistical issues around hardware exports were found to be expedited for projects, such as those in Call 2 that had an initial 'pilot' phase, with this initial engagement improving efficiency for the subsequent phases of the project.[140]

3.3.3 VfM

All awards were required to undertake a cost-effectiveness analysis to demonstrate the benefits of the project relative to a non-space solution. Reflecting the novelty of applying space-based solutions to development challenges, UKSA required all projects to conduct cost-effectiveness analysis (CEA); guidance was provided by Caribou Space and London Economics,[141] and these results were aggregated to programme level. At project level, CEA was undertaken at both midline and endline, and projects were encouraged to make changes if needed.[142] This is also a novel approach within the GCRF portfolio and offers value in justifying the investment of resources in a non-typical area of research for ODA funding. Based on this CEA, IPP projects were able to demonstrate the additionality of space solutions over terrestrial systems, with space solutions being more cost-effective than their terrestrial alternatives, across forestry, agriculture and disaster resilience sectors.[143] The CEA conducted for IPP suggested that all IPP projects were set to deliver impacts more cost-effectively than their alternatives.[144] IPP projects are also thought to be more cost-effective over longer time horizons (up to 2023 as opposed to 2021 for the short time horizon), owing to their initial substantial development costs but lower input costs as the project continues being implemented.[145] However, it should be noted that owing to the challenges many of the projects faced regarding sustainability (described in Section 4.2.4), there is a potential risk to analysis which considers longer-term horizons past the funding period of the project. However, the CEA report also highlighted that CEA does not capture all the potential benefits of space solutions, including the fact that space solutions are not subject to the same risk of human error, and that space solutions tend to be non-invasive and scalable. Furthermore, several projects went on to replicate their solution in a different market, providing better VfM per ODA pound spent.[146]

Considerations of VfM were incorporated into project selection and implementation. At the application stage, proposals are assessed against VfM criteria,[147] including aspects such as demonstration of the value that the investment would bring, financial plans and resourcing, evidence that the proposed expenses are fair, reasonable and will deliver a cost-effective outcome and proof that the space-based technology is more cost-effective than its terrestrial alternative.[148] Considerations of VfM were further discussed at the panel assessment

[137] IPP Midline Evaluation V3_Projects_FINAL – EASOS Analysis Table.

[138] IPP-P1, RE-SAT Analysis Table.

[139] IPP Midline Evaluation V3_Projects_FINAL, IPP-P1.

[140] RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[141] IPP-P4, IPP-P1.

[142] IPP-P1.

[143] UK-Space-Agency-IPP-Midline-Evaluation, IPP Annual Strategy_2019_9_30 Final, UKSA IPP Cost Effectiveness Analysis - FINAL for web.

[144] UKSA IPP Cost Effectiveness Analysis - FINAL for web.

[145] UKSA IPP Cost Effectiveness Analysis - FINAL for web.

[146] IPP-P3.

[147] IPP-P10, Input to IPP Strategy_2018_07_02 Final V1.

[148] Assessment Sheet for IPP Call 2, INDEPENDENT ASSESSORS.

meetings,[149] and for Call 3 IPP had planned to bring in additional VfM oversight and scrutiny.[150] During project implementation there were several processes that supported projects to deliver VfM, including aspects such as the development of consortia and partnerships and the minimisation of technological costs.[151] Through the consortia and partnerships, projects were provided with in-kind partner contributions, such as expertise, support or matched funding.[152] In-country staff were also used, enabling projects to coordinate work efficiently on the ground.[153] Projects were encouraged to minimise technological costs where possible, including through using free and open source satellite data, open source and cloud-based data processing tools, technologies to reduce tech development costs, and satellite data archives where available.[154] Furthermore, some projects were able to use the technologies/tools developed, such as algorithms, for other purposes, facilitating increased VfM.[155]

3.3.4 Fairness of processes

IPP projects involved consortia of UK and in-country partners, although greater involvement of in-country stakeholders was suggested as beneficial for future awards. IPP projects involved consortia of UK and in-country partners, and on the whole processes appeared to be 'fair'. In-country partners were involved in award processes from the start.[156] Proposals had to include an in-country partner, and at the proposal review stage the relationships with local partners were considered as well as the financial breakdown across partners evaluated.[157] In addition, in-country partners contributed 'in kind' and therefore did not have to support the projects through financial contributions. 82.1% of award holders agreed or strongly agreed that the contributions of those involved were clearly defined, providing fairness of opportunity, and 79.6% agreed or strongly agreed that the financial resources allocated to partners to deliver the project were proportionate. Similarly, 78.6% agreed or strongly agreed that all costs to deliver research outputs were covered in financial agreements, suggesting that there were appropriate processes in place to support fairness across project partners.

Within the IPP reporting processes, it was felt that more of the processes fell onto the prime organisations, and it was suggested that more input from in-country partners into these processes might be welcome in order to ensure that IPP heard directly from them and in order to enable more open communication and support.[158] Furthermore, it was noted that the consortia were made up primarily of UK members, and that moving more of the supply work to in-country stakeholders would have been beneficial.[159] There were examples of where greater inclusion of in-country expertise would have been beneficial. For example, EASOS had limited involvement of Malaysian space expertise in the consortium, which might have been beneficial for ensuring uptake and use of the tool.[160]

During implementation, most award holders agreed that, on the whole, project data was fairly distributed among partners, with 79.7% agreeing or strongly agreeing that ownership and use of project data are fairly distributed among partners. Finally, some awards also ensured

[149] IPP Call 2 Assessment and Moderation Meeting.
[150] IPP Midline Evaluation V3_Projects_FINAL.
[151] IPP-P4, IPP-P1.
[152] IPP-P4, IPP-P1, all award write-ups.
[153] IPP Midline Evaluation V3_Projects_FINAL.
[154] IPP-P4, and IPP-P1, IPP Midline Evaluation V3_Projects_FINAL.
[155] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.
[156] IPP-P3.
[157] IPP-P10.
[158] IPP-P6.
[159] IPP-P3.
[160] EASOS Analysis Table.

equitability among stakeholders involved in the project. For example, for COMPASS the lead organisation was conscientious to ensure that smaller farming unions were also included alongside larger farming unions in the area.[161]

3.3.5 Sustainability of the projects

IPP aims to promote project sustainability to ensure that the benefits of all projects continue after the lifetime of the fund, but this aim has not been realised. IPP aims to ensure that the DAC definition of sustainability – that the benefits of an activity are likely to continue after donor funding has been withdrawn – is achieved at both programme and project levels.[162] During the application stage, proposals are required to submit a sustainability plan and to have a work package dedicated to ensuring sustainability.[163] For several projects, this involved some aspect of expansion of the project – moving into new countries or contexts.[164] For some it involved aspects such as ensuring there was capacity development, support for staff hosting the facilities, mechanisms to ensure platform maintenance, and sustainability in terms of knowledge (such as introducing knowledge hubs, or 'training of trainer' programmes).[165] The minimum objective for all IPP projects is to ensure that the deployed solution can be handed over to an international partner and can continue to operate once the initial project has been completed.[166]

At the midline evaluation, **most projects had not secured the funding needed to ensure that projects would be sustainable**.[167] Several reasons have been highlighted for this, including that end users **were reluctant to commit funding without a workable product, trust was difficult to build in systems that were only used during particular times (disaster event or crop season), and decision making could be slow in country governments**.[168] The midline evaluation concluded that additional resources were needed to ensure that projects did meet their sustainability objectives.[169] Several of the awards in the sample had been successful in securing post-grant interest from additional stakeholders. For example, EASOS had achieved buy-in for the Marine Watch application.[170] Despite some success, Covid-19 has had a significant impact on the sustainability of awards, and for several projects there remain concerns regarding sustainability, with the future of the tool remaining unclear.

3.4 EQ 4: To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?

Box 7. Summary – to what extent have the signature programmes made early progress towards outcomes and impacts?

[161] Mexican COMPASS Analysis Table.
[162] Input to IPP Strategy_2018_07_02 Final V1.
[163] Input to IPP Strategy_2018_07_02 Final V1, IPP-P3.
[164] IPP-P3.
[165] CommonSensing Analysis Table.
[166] Input to IPP Strategy_2018_07_02 Final V1.
[167] UK-Space-Agency-IPP-Midline-Evaluation.
[168] UK-Space-Agency-IPP-Midline-Evaluation.
[169] UK-Space-Agency-IPP-Midline-Evaluation.
[170] EASOS Analysis Table.

All IPP awards made progress towards desired outcomes and impacts; however, the degree to which this was achieved varied across awards. IPP successfully demonstrated the utility of space-based approaches to development.

Outcomes from IPP. In many cases, IPP awards have shown the practical applications and value for development of space-based approaches, enabled valued and sustainable partnerships and demonstrated a positive economic return to the UK. IPP funding has also helped award holders leverage funding from other sources.

Impact of Covid-19 on outcomes. The impact of Covid-19 varied across IPP, with a number of projects being delayed in progress towards desired outcomes.

Our approach to answering the EQ

EQ 4 focuses on the extent to which the signature programmes have made progress towards outcomes and impacts. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the evaluation question for IPP, we focused on the following criteria:

- Outcomes from the programme;
- Impact of Covid-19 on outcomes.

Our findings against the IPP-specific outcomes and impacts are set out below.

3.4.1 Outcomes from IPP

All IPP awards made progress towards desired outcomes and impacts; however, the degree to which this was achieved varied across awards. IPP awards have demonstrated varying levels of success in meeting desired outcomes and impacts. The midline evaluation for IPP cited capacity building as one of the achievements of the programme (see EQ 2). Several projects, however, noted that initial objectives were not met. For example, DAMSAT has not systematically changed the approach to monitoring tailings dams – and while stakeholders appreciated the technical expertise that went into the design of DAMSAT and its potential value in managing risks, its limited testing and use meant that trust in the system was limited to a small group of users.[171] For the OASIS-TU project, the uptake of technology was also limited. One of the expected impacts of this project was that deaths at sea related to small boats would reduce by 10% year-on-year from 2018, but it cannot claim that this impact has been achieved.[172] Similarly, the project has been unable to demonstrate any significant search and rescue cost savings, owing to limited technology uptake. For this project, interview findings suggest that technology uptake was limited owing to factors that could have been foreseen earlier in the lifecycle of the project but which were not addressed until later – namely, a misunderstanding of in-country beneficiaries and their needs and receptiveness to the product that was developed through this award. Survey findings from 68 projects indicate that they had a range of outputs, with the most popular being: holding a dissemination workshop or policy forum with decision makers (54%); developing a new protocol, technique or way of doing things (54%); and developing new software or technical product (61%).[173]

IPP successfully demonstrated the utility of space-based approaches to development. Although some projects did not meet objectives, overall the evidence suggests that IPP has been successful in demonstrating the utility of space-based approaches to development.

[171] Space-based dam monitoring (DAMSAT) Analysis Table.

[172] OASIS-TU Analysis Table.

[173] GCRF Evaluation survey of award holders.

According to the midline evaluation report, the programme demonstrates that space-enabled solutions are more cost-effective than non-space alternatives in forestry, agriculture and disaster resilience.[174] The programme demonstrated that in some cases forestry monitoring from space is around 11 more times effective than ground-based approaches (such as aerial photography, drones and foot patrol) – and in agriculture, it is around seven times more cost-effective to use space data for agricultural monitoring compared to alternatives such as drones, foot patrol and extension workers.[175] The Forests 2020 project, for instance, helped to improve forest governance across 300 million hectares of forests and contributed to avoided forest loss of 4 million to 6 million hectares.[176] CEA studies showed that space-based approaches represented better VfM than alternatives for several projects, such as OASIS-TU,[177] Forests 2020[178] and PASSES.[179] It is estimated that IPP's impacts will benefit over 7 million people in developing countries,[180] with impacts across 10 SDGs.[181] In disaster resilience, space-based solutions are 1.7–1.8x more efficient than alternatives, which vary across project types.[182]

IPP has demonstrated a positive economic return to the UK. IPP's total economic return to the UK is £2.35 per £1 of public investment.[183] More broadly, IPP will generate more than £279.3 million in gross value added and support 3,300 full-time jobs (FTE).[184] Although these benefits paint a positive picture of the programme, this analysis was conducted in 2019, and therefore additional economic evaluation at the endpoint will provide a more up-to-date rate of return. Projects also noted direct benefits. For example, the legacy evaluation of the EASOS project noted benefits such as new lines of business, expansion of products and expansion into new geographies.[185]

IPP funding has helped award holders to leverage additional funding from other sources. IPP will also provide benefits for the UK space sector, including leveraging £124 million of extra revenue. Several award holders noted that IPP funding played a crucial role in helping them to go on to secure further funding from other sources. IPP funding was important at an early stage of technological development and for being able to develop systems and export services to market.[186] These award holders felt that they could not have secured such funding from other sources.[187] Once this funding had enabled initial development of systems, award holders found it easier to go on to secure other funding and to provide space-based services. Individual partners from the Forests 2020 programme, for example, were able to leverage funding from the Global Environment Facility (GEF), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Japan International Cooperation Agency (JICA), while the lead

[174] IPP midline evaluation.

[175] IPP-P5.

[176] Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[177] OASIS-TU Analysis Table.

[178] Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[179] Peatland Assessment in Southeast Asia by Satellite (PASSES) Analysis Table

[180] Input to IPP Strategy_2018_07_02 Final V1.

[181] IPP Midline Evaluation V3_Projects_FINAL.

[182] IPP midline evaluation.

[183] Economic evaluation of the International Partnership Programme (IPP): Economic return to the UK. London Economics 2019. https://www.spacefordevelopment.org/library/economic-evaluation-of-the-international-partnership-programme-ipp-economic-return-to-the-uk/

[184] Economic evaluation of the International Partnership Programme (IPP): Economic return to the UK. London Economics 2019. https://www.spacefordevelopment.org/library/economic-evaluation-of-the-international-partnership-programme-ipp-economic-return-to-the-uk/

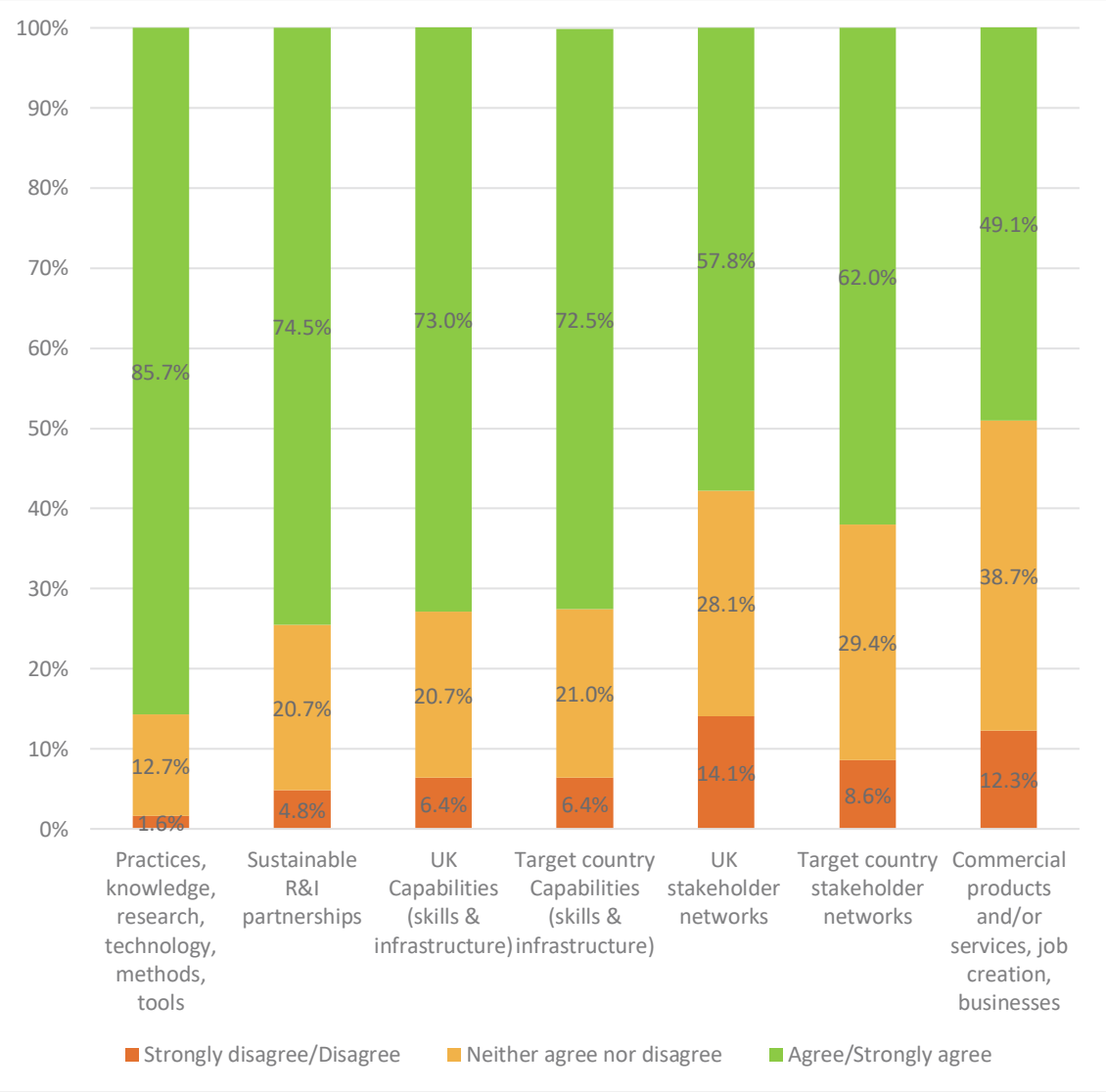
[185] EASOS Analysis Table.

[186] EASOS Analysis Table.

[187] EASOS Analysis Table.

organisation was able to leverage the commercial services that came from the project.[188] IPP funding was also instrumental in helping PASSES achieve longer-term stability through funding from sources such as Shell and Natural England.[189]

Figure 8: Project contributions to key GCRF outcomes according to survey responses



3.4.2 Impact of Covid-19 on outcomes

The impact of Covid-19 varied across IPP, with a number of projects being delayed in progress towards desired outcomes.

The impact of Covid-19 varied across IPP. While around 20 projects managed to complete on time, 9 were delayed.[190] Covid-19 had a significant impact on the ability of award holders to make in-country visits.[191] It was felt by some at programme level that while virtual solutions were used, even for projects that completed on time, this lack of face-to-face interaction had a negative impact on relationship building, the ability to develop and test solutions in-country

[188] Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[189] PASSES Analysis Table.

[190] IPP-P5.

[191] IPP-P5; IPP-P4; IPP-P2.

and the handing over of tools developed, and ultimately made it hard for IPP projects to finish well.[192] As such, the lack of face-to-face interaction appears to had a negative impact on the sustainability of projects (see also Section 3.3.5 on the sustainability of the projects). One example of this is the COMPASS project. The project lead wanted to make a commercial product in which farmers could have free access to the tool. It was felt that more face-to-face interaction with growers and end users would have been useful in helping to achieve this; however, this was limited by Covid-19. Although webinars were used as an alternative, it was felt that these did not have the same impact.[193]

3.5 EQ 5: What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes, in different contexts? (Context, causal factors)

Box 8. Summary – what particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes?

Political, governance and security factors. Political challenges and limited understanding of in-country bureaucratic structures resulted in project delays; however, where project teams had a good understanding of the in-country context, this supported teams to mitigate challenges around political and governance structures.

Physical and geographical challenges. Some IPP projects experienced physical and geographical challenges which resulted in the cancellation of activities and travel limitations.

Equipment, data and local professional capacity. IPP projects experienced local capacity challenges, causing barriers to implementation which delayed the development and uptake of tools and technologies. There were also difficulties around data quality and access, which impacted on the timelines for delivery. Demonstrating the value of the tool and ensuring stakeholder buy-in were important factors to enable effective update of the tool.

Consortium size and project management. Some IPP projects experienced difficulties around consortium size and communication. Proactive and regular communication across the project consortia was seen as an enabling factor, and communication and flexibility from the IPP team were seen as positive drivers for project implementation.

Our approach to answering the EQ

EQ 5 focuses on the features of IPP processes that have made a difference in overcoming barriers and achieving outcomes. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the EQ for IPP, we focused on the following criteria:

- Barriers to achieving outcomes.
- Enabling factors to overcoming barriers and challenges.

Our findings against the IPP-specific barriers and enabling factors are set out below.

[192] IPP-P1; IPP-P5; IPP-P4; IPP-P2.

[193] Mexican COMPASS Analysis Table.

3.5.1 Factors affecting the achievement of outcomes

3.5.1.1 *Political, governance and security factors*

A key outcome of IPP projects is ensuring the uptake and use of the tools and technologies in-country, requiring stakeholder buy-in and support. Political challenges and governance structures impeded engagement with in-country stakeholders; however, where project teams had a good understanding of the in-country context, this mitigated these challenges and supported teams to successful delivery.

Political challenges resulted in project delays and the need for additional resources. 38.8% of awardees stated that political, governance and security challenges posed a moderate or significant barrier (Figure 9:). The political economy in the target countries created challenges to project implementation, primarily due to the high turnover of in-country government staff.[194] This was felt to impact on the stability of the in-country commitments to the project, as well as resulting in a lot of additional effort to communicate and get stakeholders on board with each change. When government stakeholders changed, this sometimes changed their priorities, and this resulted in lessening project commitments; for example, projects were promised funding for sustainability, but then this did not materialise.[195] Furthermore, some awards experienced bureaucratic delays in getting approval and data-sharing agreements across the agencies involved.[196] As highlighted in the GCRF ToC, this demonstrates that there might be windows of opportunity within the policy cycle whereby research can be better positioned for impact, and these should be used where possible.

Limited understanding of in-country bureaucratic structures resulted in project delays. In the target countries, bureaucratic structures and communication challenges around preferred modes of communication were highlighted as challenges impeding project delivery.[197] Stakeholder engagement through emails and conference calls was found to not be sufficient to build trust between the UK partners and in-country stakeholders. There were also delays where project outputs required signoff or inputs from international partners, and where hardware had to be exported to the country, resulting in delays in terms of export licences, customs inspections and import valuation.[198] In addition, inadequate time frames for the scoping stage of projects were suggested as limiting understanding of the country, including cultural context, and also of relevant stakeholders and existing tools.[199] This limitation on the time frame for scoping was suggested as impacting on the collaborative working arrangements with in-country partners.[200]

Where project teams had a good understanding of the in-country context, this supported teams to mitigate challenges around political and governance structures. International partners and in-country representation were suggested as important to navigate the potential pitfalls, understand the local context and ensure engagement of end users.[201] In addition, interviewees highlighted the importance of stakeholders such as the UK embassy, who had contacts within the countries and could support projects.[202] Ambassadors, high commissioners

[194] IPP-P6, IPP-P4, IPP_P2.

[195] EASOS Analysis Table, RE-SAT Analysis Table, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, Mexican COMPASS Analysis Table, PASSES Analysis Table.

[196] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[197] IPP Midline Evaluation V3_Projects_FINAL.

[198] IPP Midline Evaluation V3_Projects_FINAL, SatDRR Analysis Table.

[199] EASOS Analysis Table.

[200] EASOS Analysis Table.

[201] IPP-P3, IPP-P2, UK-Space-Agency-IPP-Midline-Evaluation, CommonSensing write up, Mexican COMPASS Analysis Table.

[202] IPP-P6.

and FCO staff were also highlighted as important.[203] UKSA were also seen as key to supporting some of the in-country stakeholder engagement by providing introductions to in-country officials and facilitating relationships.[204] Visits to implementation sites were also thought to be an important factor for ensuring a good understanding of the context in which the tool was being developed.[205] The requirement that all projects have a baseline evaluation which included stakeholder consultation supported engagement with end users and stakeholder mapping, facilitating understanding of the in-country landscape.

The introduction of the discovery phase into IPP was also highlighted as highly beneficial to support increased co-design and context mapping, and to allow projects more time to design and work out the contributions and responsibilities of partners (see EQ 1 for further information).[206] The discovery phase enabled more analysis of the political economy and understanding of end users, reducing the risks associated with these aspects of implementation.[207] Where Call 2 projects had a 'pilot' phase, this was suggested as highly effective for stakeholder engagement, as well as providing an opportunity to test the technical tool before scaling up to other contexts.[208]

3.5.1.2 Physical or geographical factors

IPP projects target countries across the globe, with several awards developing tools and technologies targeting disaster areas. Physical and geographical challenges caused delays to projects.

Some IPP projects experienced physical and geographical challenges which resulted in the cancellation of activities and travel limitations. 31.8% of awardees stated that physical geographical challenges posed a moderate or significant barrier, with a further 3.2% stating that these posed an extreme barrier (Figure 9:). Some IPP awards were working in disaster areas.[209] For example, CommonSensing was implemented in three target countries, each of which experienced an unusual number of tropical depressions (cyclones/flooding) during the project. This resulted in the cancellation of activities, travel limitations and limitations to staff availability.[210] Furthermore, many IPP projects focus on developing tools to support physical challenges. For example, the COMPASS app was developed for seasonal crops, and therefore data could only be collected at certain times of the year.

3.5.1.3 Equipment, data and local professional capacity

A key outcome of IPP projects is building capacity and ensuring that the tools and technologies developed are taken up by end users. Challenges in local capacity and data access impeded the development and uptake of the tools, and the effectiveness of capacity building varied across awards (for further discussion on this, please see EQ 2). Having a thorough understanding of end user capacity needs and being able to demonstrate the potential value of the tool supported engagement and uptake.

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[203] IPP Midline Evaluation V3_Projects_FINAL, Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[204] Mexican COMPASS Analysis Table, Space-based dam monitoring (DAMSAT) Analysis Table.

[205] IPP Midline Evaluation V3_Projects_FINAL, Mexican Crop Observation, Management and Production Analysis Services System (COMPASS) Analysis Table.

[206] UK-Space-Agency-IPP-Midline-Evaluation.

[207] IPP-P3.

[208] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[209] IPP-P4.

[210] CommonSensing Analysis Table.

IPP projects experienced local capacity challenges which delayed the development and uptake of tools and technologies.[211] Projects underestimated the skill set and capability of international partners and end users, and this limited the extent to which the solutions could be successfully implemented.[212] Having a thorough understanding of end user capacity – and plans to ensure that users meet the minimum requirements – was highlighted by the midline evaluation as a key lesson before undertaking capacity building activities.[213] There were also limitations around technical capacity in-country, in particular aspects around the technical hardware needed to support the tools, limitations around infrastructure and Internet connectivity. [214]

IPP projects experienced difficulties around data quality and access, which impacted on the timelines for delivery.[215] Furthermore, one award experienced reluctance by a government department to use the tool for effective decision making before the complete handover, resulting in underachievement of project objectives at the midline evaluation.[216]

Demonstrating the value of the tool and ensuring stakeholder buy-in were important factors to enable effective update of the tool. Awards that were able to demonstrate the value of the tool in real world settings were able to gather interest.[217] Awards also employed alternative technical methods to demonstrate value, as well as in-depth stakeholder consultations, to increase stakeholder buy-in.[218] Where there were technical risks associated with the data and modelling techniques used, awards addressed these through field validation and use of publicly available data.[219] The emphasis on capacity building enabled greater uptake of the tool (discussed in detail in EQ 2).

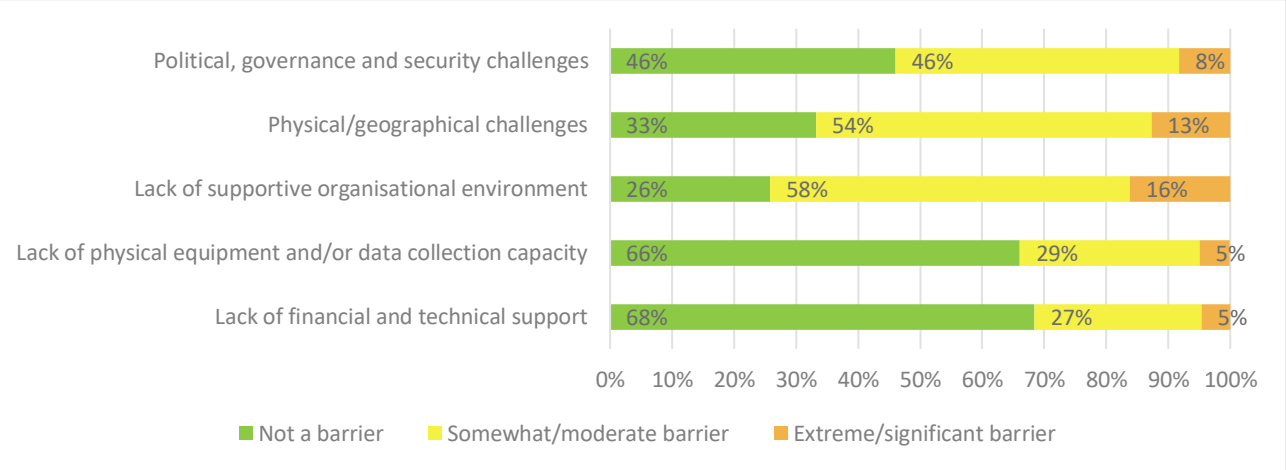
3.5.1.4 Project management and consortium size

IPP project teams tend to be large consortia across several organisations. This large consortium size provides vast expertise but can create challenges for communication and project delivery. Proactive and regular communication was seen as an enabling factor supporting project delivery.

Some IPP projects experienced difficulties around consortium size and communication. The evidence suggested that for some awards the large consortium size, and ways in which the consortia were managed, posed challenges.[220] The large consortium size meant that coordination and management of the project teams was more difficult. This resulted in misunderstandings regarding project outputs and timelines and resulted in discrepancies across the project teams.[221] Furthermore, staff turnover, particularly within key roles such as that of the project manager, caused difficulties.[222]

Figure 9: Barriers to implementation reported by survey respondents

[211] RE-SAT Analysis Table.
[212] IPP Midline Evaluation V3_Projects_FINAL.
[213] IPP Midline Evaluation V3_Projects_FINAL.
[214] CommonSensing Analysis Table, Mexican COMPASS Analysis Table.
[215] EASOS Analysis Table, RE-SAT Analysis Table.
[216] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.
[217] EASOS Analysis Table.
[218] EASOS Analysis Table, RE-SAT Analysis Table.
[219] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.
[220] EASOS Analysis Table, CommonSensing Analysis Table.
[221] EASOS Analysis Table, CommonSensing Analysis Table, Space Based Dam Monitoring.
[222] Mexican COMPASS Analysis Table.



3.5.2 Enabling factors to overcoming barriers and challenges

Proactive and regular communication across the project consortia was seen as an enabling factor. Awards where there was proactive communication, including regular meetings and well-defined plans for delivery, facilitated coordination and implementation.[223] Good project management structure and use of the expertise within the consortium were suggested as important to successful implementation.[224] Clear roles and responsibilities within consortia also facilitated successful implementation. Furthermore, where consortia had complementary expertise, or experience in building similar tools, this supported successful project implementation.[225]

Communication and flexibility from the IPP team were seen as positive drivers for project implementation. Award-holders differed in the degree to which there was communication between themselves and the IPP team. For some awards, partners were dissatisfied when they felt that all communication was handled by the lead and therefore they had less contact with either the IPP team or other members of the consortium.[226] In contrast, other award holders were positive about the communication they had during the project, citing regular communication with Caribou Space as being a positive driver of the project.[227] Furthermore, IPP was seen to offer flexibility, with aspects such as project extensions being helpful in supporting project implementation.[228]

[223] EASOS Analysis Table, RE-SAT Analysis Table, Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[224] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[225] Improving forest monitoring systems through better application of satellite data (Forests 2020) Analysis Table.

[226] Mexican COMPASS Analysis Table.

[227] PASSES Analysis Table.

[228] EASOS Analysis Table, IPP Annual Strategy_2019_9_30 Final.

3.6 EQ 6. What can be learned about the additionality (uniqueness) of GCRF funding from:

- **how the signature investments have adapted their approach in response to Covid-19**
- **the impact of the 2021 funding cuts on the signature investments?**

Box 9. Summary – What can be learned about the additionality of GCRF funding?

Unique aspects of GCRF funding. IPP has been a unique programme in realising the impact of space in the development sector, providing a large scale of investment and a strong focus on M&E.

The impact of the funding cuts to the programme. Call 3 projects within IPP were the most heavily impacted of the IPP projects, and this caused a significant negative impact on the project teams as well as reputational damage to the UK more widely.

Our approach to answering the EQ

EQ 6 focuses on the additionality of GCRF funding. Our evaluation matrix set out a wide range of criteria, not all of which apply in the IPP context. To answer the EQ for IPP, we focused on the following criteria:

- Unique aspects of GCRF funding
- The impact of the funding cuts to the programme.

Our findings specific to IPP are detailed below.

3.6.1 Unique aspects of GCRF funding

IPP has been important in realising the impact of space in the development sector. UKSA does not have an ODA budget, and at programme level there was consensus that a multi-year programme with a development focus could not have happened without GCRF funding.[229] At award level, when grantees were asked whether their project would have proceeded without IPP funding, 80% stated their project would not have occurred at all and 20% stated it would have occurred but at a different scale and form.[230] This finding at award level was mirrored in interviews conducted with award holders, with all grantees noting that their project either could not have happened without IPP funding or would have happened on a far smaller scale or without the focus on development. The spectrum of ideas covered and the problem to be solved were also seen by several award holders[231] to have an advantage over development programmes from countries such as Canada, which tend to be very narrow in their scope.[232]

The scale of the investment was noted to be a unique aspect of GCRF funding. There was consensus among award holders that the scale of the investment was a unique and important aspect of IPP. One award holder noted that the scale allowed projects to actually build

[229] IPP-P5; IPP-P6; IPP-P1; IPP-P11.

[230] UKSA IPP UK Economic Return - FINAL for web.

[231] IPP-A46; IPP-A41.

[232] OASIS-TU Analysis Table.

products and take them to the market. The arrangements on IP and partnering were also noted as being beneficial because there were no claims on IP, which allowed the focus to be on developing tools. This award holder noted that they did not know of any other source from which they could have received such support.[233]

The focus on M&E, particularly within the space sector, was noted as a unique aspect of the programme.

The M&E activities within IPP were seen as a unique aspect of the programme, compared to other programmes within UKSA. This was because of the need to have robust frameworks in place regarding ODA funding. Award-holders noted that this focus was a unique aspect for them.

3.6.2 The impact of the funding cuts on IPP

The ODA cuts had the largest impact on Call 3 IPP projects. These projects had completed their discovery phase but were unable to move into their implementation phase. This had a large negative impact on the project consortia involved in Call 3, as project teams had put substantial effort into the initial phase of the project with the expectation that it would continue.[234] This resulted in a loss of work for the consortia as they had put substantial effort into building stakeholder relationships, and some had started the technology development. The IPP team had put several requirements that the projects had to meet in this initial phase to ensure that they were adequately prepared for the implementation phase,[235] and therefore it was a shame that this was wasted. Interviewees also highlighted the reputational damage for the UK as a result of the ODA cuts. It was noted that the formal communication of the cuts was done quite late, and this contributed to the damage in trust between UK and in-country partners.[236] Some Call 1 and Call 2 projects were impacted by the ODA cuts, but owing to the timings this was much more limited in scope compared to Call 3. It is unclear whether the Call 3 projects will be able to secure additional funding elsewhere. UKSA are considering whether support can be given to some of the Call 3 projects with small follow-up phases. It is likely that these projects will no longer have an ODA focus but instead will focus on technical development, with a focus on supporting the UK economy and national space strategy.[237]

[233] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table.

[234] IPP-P2, IPP-P1, IPP-P6.

[235] IPP-P2.

[236] IPP-P3, IPP-P2.

[237] IPP-P5.

4 Conclusions

This section draws out the main conclusions from this evaluation and describes where lessons can be learned for future programmes. This is then further expanded in Section 5 on lessons and recommendations.

IPP has been a unique programme in realising the impact of space in the development sector. As a test case for the use of space technologies in development the programme has been a success, demonstrating that there are practical applications and value for development in space-based approaches. Beyond laying the groundwork for potential future space-based development programmes, IPP has also achieved a range of outcomes – despite some Covid-19-related delays – including establishing valued and sustainable partnerships and demonstrating a positive economic return to the UK from the investment made. Outcomes from the individual awards were varied, and some technologies were not found to be successful for the intended purposes as might be expected for an innovative and novel R&I programme.

The programme was carefully designed with development and delivery considerations in mind. This is clearly demonstrated by: the development of detailed ToCs at programme and award levels; a careful award selection process and commissioning process, which were adapted and improved over the course of the programme in response to learning; and the establishment of a process to consider factors such as VfM.

M&E processes were a particular strength of IPP and have demonstrated that an extensive M&E approach ensures that impacts can be measured, and lessons can be learned. One of the unique aspects of IPP is the extensive role of M&E activities that are undertaken at programme and award levels. These were highly valued, as they enabled awards to clearly state their outcomes and demonstrate where they had impact. Although these activities are costly, they have enabled projects to keep track of their progress and learn lessons during implementation, allowing for course-correction where possible. Caribou Space have made a large amount of the evaluation reports public, and therefore lessons can be learned not only across the IPP programme but also more widely across the development sector. Ensuring that M&E plans are made available at the start and that projects and funders budget accordingly is critical for successful implementation. For IPP, Caribou Space were brought in after the initial call, and therefore projects within this initial stage had not always anticipated the degree of M&E that was later implemented**.**

IPP has demonstrated that projects requiring substantial in-country stakeholder engagement should consider adopting an initial 'discovery' or exploration phase to ensure effective understanding of the project context. A good example of learning from ongoing M&E processes that IPP has in place is identifying the importance of a good understanding of the in-country context. IPP has demonstrated that this is critical to the success of projects and the ultimate sustainability of the technical solution. Where the technical and skill capacity had been overestimated in the target country, this led to difficulties further down the line during project implementation. Similarly, ensuring stakeholder and end user buy-in was critical for sustainability. In their third call, IPP have already started to address some of these issues by the introduction of a discovery phase – a one-year initial phase to the project which supports the project team to explore the context for the project and develop stakeholder relationships. Unfortunately, these projects were cut short due to the funding cuts.

IPP has demonstrated that large consortia provide vast expertise, but future programmes should consider how they are managed to ensure effective engagement. Another area of learning within IPP that could be relevant to future programmes is around the management of large consortia. The consortia within IPP were large, enabling expertise across organisations and sectors to be brought together to deliver the project. This was seen as extremely positive, and enabled projects to adopt a truly interdisciplinary approach. In terms of overall management, the IPP team primarily dealt with the prime organisation (project lead). On the whole, feedback regarding the project primes was positive. However, it was highlighted that project consortium members would have benefited from greater contact with the IPP team, as well as from a better oversight of the progress and direction of the project. There were instances where consortium members were working towards different timelines, and where UKSA were not always aware of issues raised by the smaller consortium members. Ensuring that funders engage with all the partners – such as a partner spokesperson – across each of the consortium members could minimise levels of miscommunication, ensure that all partners felt heard, and ensure a more thorough oversight of each of the projects within a portfolio. This would result in greater management costs for the funder but may result in efficiencies during project implementation, as there would be the potential to catch any issues early, and it would ensure that all partners and funders are on the same page.

Sustainability of projects beyond the lifetime of the award has been a key challenge. IPP aims to promote project sustainability to ensure that the benefits of the project continue after the lifetime of the fund; however, projects continued to find this challenging. As noted above, knowledge of and engagement with key in-country stakeholders and their priorities is one factor that is critical in sustainability of solutions, and is an area where IPP has faced some challenges, particularly in the earlier phases of the awards. Early engagement to understand local capacities to uptake the technologies is also an important factor, and in some cases the degree of local capacity building that would be needed had been underestimated. Funding cuts to the scheme also had an impact on the later stages of several of the awards – along with delays due to Covid-19 – which influenced the extent to which measures to transfer learning and ensure sustainability of project outcomes could be implemented.

Overall, IPP is an effective programme that has delivered a novel portfolio of development-focused space R&I, taking development considerations into account, and showing the ability to adapt and learn over the lifetime of the programme. Certainly, IPP was something of a foray into the unknown for UKSA, representing their first development programme of work, and as such there have been, as expected, some examples of learning and improvement as the project evolved. However, despite the novelty of the programme, careful consideration was given to the unique challenges and opportunities of conducting space R&I in a development context from the outset, and a comprehensive programme of M&E, including expert external support, was put in place to ensure that learning could happen and be implemented on a rolling basis. There is clear evidence of a response to challenges that emerge, and the programme has been successful in laying the groundwork for ways in which space-based solutions can be effective – and cost-effective – for supporting development outcomes, as well as for delivering some specific useful solutions that can be taken forward – although some of these ultimate outcomes have been curtailed by both the funding cuts and the impact of the Covid-19 pandemic. Both the achievements of the programme and some of the challenges and barriers encountered offer valuable lessons for future space-focused and wider development-oriented R&I programmes.

4.1 Lessons and recommendations (EQ 7)

4.1.1 Recommendation 1 – Ensure substantial and continued engagement with end users to support technical solutions that meet user needs

Where future programmes are attempting to deliver technical solutions to support user needs, engagement with local stakeholders and end users is required throughout project design and implementation. This ensures that technical solutions remain appropriate to user needs as well as ensuring that there is buy-in from local stakeholders.

Interviewees stressed the importance of understanding the local context and ensuring user buy-in throughout project implementation (see EQ 5). Engagement with end users was stated as an important component from project inception through to implementation, particularly as projects needed to consider the constraints that end users might face in-country.[238] Having engaged in-country partners or local staff as part of the consortium was stated as one way of facilitating this.[239] Within IPP, awards tended to underestimate the resources required for building partnerships.[240] Having longer 'discovery phases' – something that IPP introduced formally in Call 3 – was one way to provide adequate time and resources to facilitate these relationships and to enable both UK and in-country partners to engage in co-design of the project.[241] Ensuring stakeholder buy-in across relevant stakeholder groups could be a way to support longer-term commitments, with an emphasis on resourcing engagement and maintaining stakeholder relationships at both individual and institutional levels throughout the implementation cycle, in order to navigate the dynamics of changing political contexts and personnel. Future programmes may wish to implement a similar model (for example, 1 + 5 years), allowing for projects to have a longer initial inception phase before moving on to implementation. This is likely to be relevant not only to projects tackling development challenges but also to any projects which are entering a new market, new country or new context and where sufficient framing of the project around user requirements is needed.

4.1.2 Recommendation 2 – Promote mechanisms to support M&E to ensure that impacts can be measured, and lessons can be learned

The extensive M&E undertaken by IPP has ensured that outputs and impacts from the awards can be documented, as well as lessons learned as the programme has evolved. This has ensured that IPP had adapted as it has progressed, as well as being able to provide broader lessons for the development and space sector.[242]

To ensure that M&E frameworks are taken up successfully, they should be developed at programme establishment. This ensures that projects are aware of the requirements from the beginning and can build them into their processes and budgets. Shared templates and guidance support award holders through the process and ensure that there is some degree of standardisation across awards, which means that project impacts can be combined at programme level.

Providing evidence of what has worked and what has not – both for individual awards and for programme level processes – supports VfM and ensures that similar barriers or challenges can be mitigated where possible. This is particularly important for programmes working within new contexts or environments.

4.1.3 Recommendation 3 – Ensure that time scales and targets remain realistic to get the maximum impact and utilise project outputs effectively

Where future programmes are addressing complex challenges or working within novel environments, timescales must be appropriate to ensuring that outputs can be achieved during the lifetime of the

[238] IPP-P5.

[239] IPP-P1, IPP Midline Evaluation V3_Projects_FINAL.

[240] IPP Midline Evaluation V3_Projects_FINAL.

[241] IPP Midline Evaluation V3_Projects_FINAL, IPP-P3.

[242] IPP Midline Evaluation.

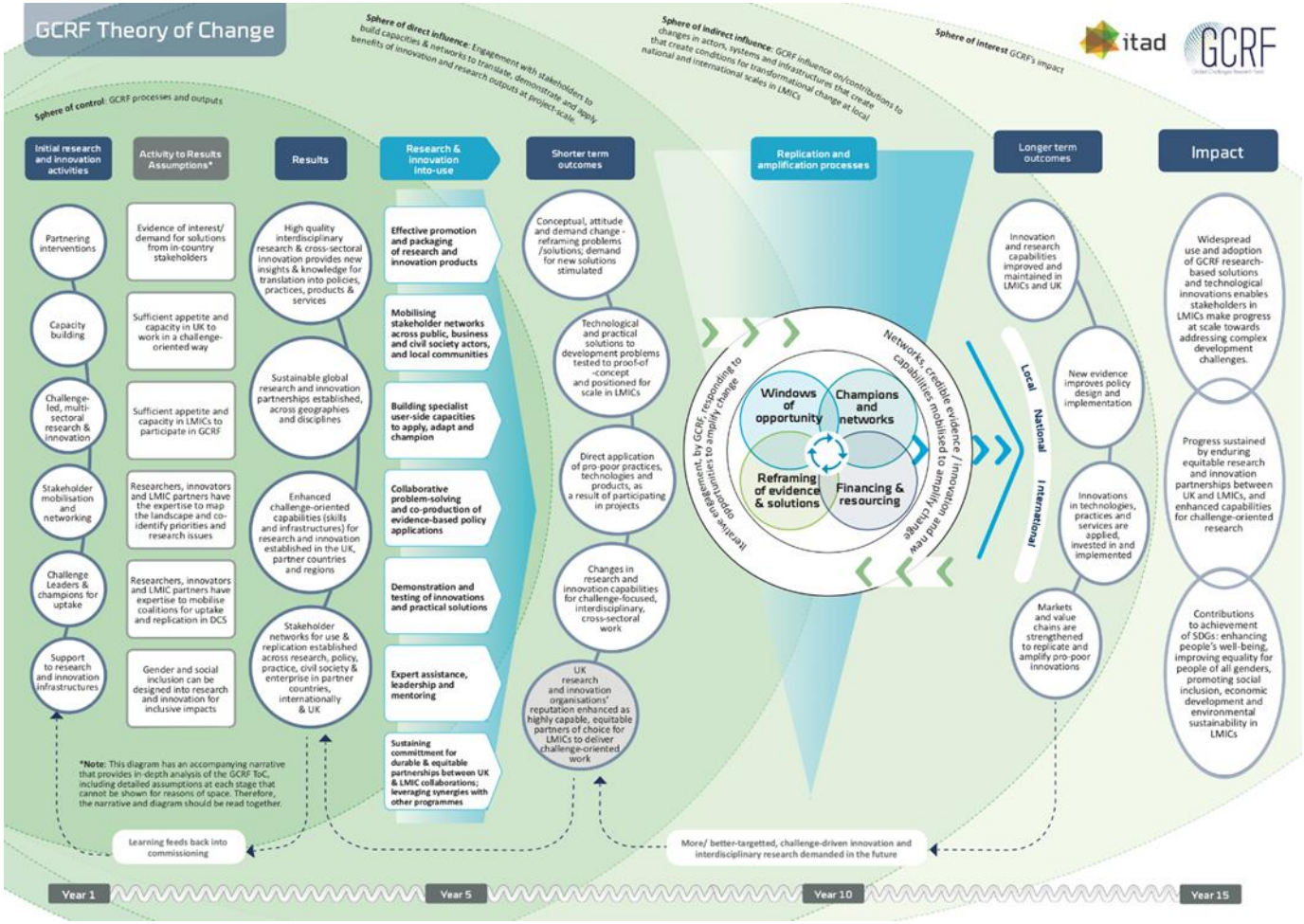
project. This ensures that impacts can be fully realised and that technical solutions and tools can be handed over to end users in a useful manner.

Award-holders noted that a longer-term time frame would be beneficial in order to observe the impact of projects.[243] As highlighted in this evaluation, the contexts within which projects were working were challenging, including political, geographical and technical challenges. This meant that projects had limited opportunity to both develop the technical solution and engage effectively with policymakers and end users to ensure sustainability. It was noted that 3–5 years is a short time frame to observe large-scale impacts,[244] and this should be considered when developing a programme and creating realistic expectations. For example, building on the insights about the importance of a specific 'discovery' phase, additional phases could be used to structure the programme, such as 'demonstration and proof of concept' in the shorter term, with longer term phases that focus on 'marketing and scaling'. Furthermore, it was noted that using proven technologies and applying these to new markets tended to be more successful than undertaking the majority of the R&D from scratch.[245] Future programmes should consider these aspects to ensure that they are framed appropriately. Where tools have been developed with the goal to hand over to end users, there need to be appropriate time frames to do this. Where project consortia are working in new or challenging contexts, ensuring that other aspects of the project remain less complex could support implementation.

[243] Deforestation prevention with land use monitoring and valuation in Côte d'Ivoire Analysis Table, PASSES Analysis Table, Space-based dam monitoring (DAMSAT) Analysis Table.
[244] IPP-P1.
[245] IPP-P3.

Annexes

Annex 1: GCRF Theory of Change



Annex 2: Research tools

Annex 2a: KII topic guide

Instructions

Topic guides will need to be contextualised for individual stakeholders.

- **Build your own topic guide:** You should select questions from here and contextualise them to the Process Evaluation specific area.
- **This template should also be used as the KII Write-Up Template –** save a copy of each template with the name of the KI, and save in your folders.
- **Consent:** Please give respondents the introduction and ensure that you have gained explicit consent.

Topic guide

Programme/Award	
Interviewee name	
Position and organisation	
Interviewer name	
Date of interview	

Introduction

Background:

- We are evaluators from Itad, RAND Europe and NIRAS-LTS – a UK-based consortium of research organisations with specialisms in evaluation.
- We have been commissioned by BEIS to carry out an evaluation of GCRF.
- The purpose of this interview is to understand [adapt as relevant].
- The interview will last around 45–60 minutes.

Consent

- As this is an independent evaluation, all interviews are confidential, anonymised and non-attributable. Everything you tell us will be confidential, and your name will not be used in any of our reports. We may use quotes from the interview in our reporting, but all quotes will be non-attributable.
- Do you have any questions about the research, or concerns you would like to raise before we start?
- Do you consent to be interviewed on this basis? [Y/N]

Recording consent [only if you choose to record]:

- We would also like to record the interview to facilitate note-taking and later analysis. The recording would not be accessed by anyone beyond our team and would be deleted following analysis.
- Do you consent to being recorded on this basis? [Y/N]

TOPIC: 1. **Structures and processes in place to support challenge-led research with development impact, within signature investment awards and programmes**			
	SUB-TOPIC	**QUESTIONS**	**PROMPTS FOR CRITERIA**
1	Selection and set-up processes	1. Could you tell us a little about your role within [name of programme]? 2. Why was [insert name of signature investment here] set up and what are its goals? 3. How was the ToC developed and who was involved? 4. How was the scope of the call defined and who was involved? a. Were priorities developed based on existing research and stakeholder needs? If so, how? b. How was coherence? 5. What were the eligibility criteria for applicants? Were any particular applicant groups targeted? 6. What were the timelines for application? How long were calls issued for? 7. How are proposals evaluated? a. Who is involved in the evaluation process and how are they selected? b. What are the criteria for selection? c. How long does the evaluation process take and what were the demands on different groups?	• Scoping and framing of challenge for relevance and coherence • ToC and shared vision • Commissioning and selection of portfolio to deliver against challenge • Framing of eligibility of applicants and target groups • What gender and poverty dimensions were integrated in the call • The process of identifying the gender and poverty dimensions, e.g. access to experts • Was there a fund-specific gender equality commitment outlined at the ouset or were any gender/inclusion dimensions integrated with the call's objectives? [Translates into dedicated resources]
RESPONSES HERE:			

2	Design and Implementation processes (ODA research excellence)	1. How are specific development considerations built into the process of call development and proposal evaluation? For example: a. Gender responsiveness b. Poverty and social inclusion c. Equitable partnerships and wider fairness d. Relevance to local needs e. Coherence with the wider portfolio (in the programme, in GCRF, elsewhere)	• Relevance + coherence in design and delivery • Strategic/holistic/system lens, inlcuding interdisciplinarity • Gender responsiveness and poverty addressed in design and processes, e.g. gender in context analysis • Gender balance/composition of the evaluation team • Inclusion of 'gender experts' as part of the evaluation team and in the design of the calls for proposal? • Target for women applicants? • Evaluation criteria – gender equality scoring • Gender balance in the research team? • Gender expertise in the team? • Inclusiveness (SEDI) addressed within design and research processes • Capacity needs identified and assessed • GESI considered in stakeholder engagement and dissmenination design

RESPONSES HERE:			
3	Management of the programme and awards	1. How do you manage your portfolio to ensure it is coherent and take advantage of synergies where they exist? a. How do you coordinate and interact with other parts of GCRF? b. How do you make your portfolio work together, both within the programme itself and within GCRF? c. What opportunities are there for networking between award holders? d. How do you support interdisciplinary research? 2. How do you manage the award/programme to ensure that development considerations are integrated into delivery in an ongoing way? a. Gender responsiveness b. Poverty and social inclusion c. Equitable partnerships and wider fairness d. Relevance to local needs 3. How do you manage and adapt to changing circumstances? a. What did you do to manage COVID-19? b. What did you do to manage the funding cuts? c. Are there any other circumstances in which you have had to be agile? Do awards have flexibility to change in response to circumstances once they have started? 4. How, if at all, do you consider the potential negative consequences of the award/programme? a. What are the potential risks and how do you mitigate them?	▪ Hands-on programme management (e.g. cohort-building, aggregate-level R&I into use) ▪ Flexibility to respond to events and emergencies, e.g. Covid-19 ▪ Addressing barriers to interdisciplinary working ▪ Promoting coherence between awards ▪ Negative consequences mitigated and a 'do no harm' approach ▪ Facilitating learning for adaptation and legacy ▪ Guidelines/capacity building on the integration of gender analysis into research/innovation cycle ▪ Engagement with gender experts ▪ M&E and regular reporting ▪ Programme level - how are they monitoring gender, e.g. track applicants, track minorities and how much grant was sought, how much grant was awarded, female researchers tend to ask for less funding and get less

		b. How do you ensure you do no harm? 5. What are your monitoring and evaluation processes? a. How do you ensure the information helps inform learning and improvement, within awards, within the programme, across GCRF?	▪ Do they have a gender equality strategy, how are they tracking that, systems and monitoring across awards?
RESPONSES HERE:			

4	Capacity development	1. How is capacity strengthening delivered in the programme? ○ How do you assess capacity needs? For LMIC partners and for UK partners. ○ How do you ensure capacity strengthening is supported? ○ How do you assess it? ○ At which levels does capacity strengthening occur (in both directions)? ○ How are fairness considerations included in your capacity strengthening?	• Clear Theory of Change for how capacity development contributes to the desired programme outcomes • Including capacity development for UK partners as well as LMIC partners • Analysis/understanding of local R&I ecosystems and capacity needs • Gender and inclusion analysis of capacity needs, both LMIC and UK • Capacity support that aligns with good practive provided to individuals, organisations and/or R&I infrastructure • Fairness considerations integrated • Tracking of GESIP and Fairness aspects
RESPONSES HERE:			

5	Engagement	How do you ensure the work you support is well positioned for use? a. What are your engagement and dissemination strategies? b. How do you build and maintain relationships with potential users of research? c. How much happens at the programme level and how much is left to award holders? d. Is Gender and inclusion factored into the development of engagement strategies?	1. Fairness in engagement with local research ecosystems/stakeholder engagement 2. Positioning for use in design and delivery ('fit for purpose' engagement and dissemination strategies; relationship building; best platforms for outputs for the target audience and users)
RESPONSES HERE:			

TOPIC: 2. **Efficiency, proportionality and VFM of processes to support challenge-led research**			
	SUB-TOPIC	**QUESTIONS**	**PROMPTS**
1	Efficiency, proportionality of processes Fairness for partners	1. To what extent are processes efficient and proportionate? Why/why not? 2. To what extent do processes promote VfM and cost-effectiveness? How/how not? 3. To what extent are processes fair for LMIC partners? Why/why not?	Efficiency and timeliness of processes Fairness for partners Processes promote a focus on GESIP

RESPONSES HERE:

TOPIC: 3. **Early progress towards desired outcomes/impacts**			
	SUB-TOPIC	**QUESTIONS**	**PROMPTS**
1	Key outcomes and achievements	What have been the key achievements and outcomes of the programme? a. How well do these align with your ToC and vision for the programme? b. Have there been any unintended or unexpected outcomes (positive or negative)? 2. What impact has Covid-19 and the funding cuts had on your ability to achieve these outcomes? 3. Beyond Covid-19 and the funding cuts, what have been the barriers to delivering on your intended outcomes? For example: i. Risks in the research environment (organisation, support for research) ii. Risks in the political environment (underdeveloped policy environment, unstable political context, local recognition of issues) iii. Risks in the data environment (data availability and agreements) 4. What factors have helped overcome barriers and achieve the intended outcomes? For example:	Results and outcomes from programme ToCs Impact of and adaptation to Covid-19 on progress Unintended outcomes (positive and negative) GESIP-related outcomes Contextual factors shaping the interventions and outcomes: • Maturity of the field • Research capacity strengthening • Risk in the research environment (i.e. organisational contexts' support for research) • Risks in political environment (i.e. underdeveloped policy environment, unstable political context, local recognition of the issues and LMIC communities themselves) • Risks in data environment (i.e. data availability and agreement on measures)

		i. Organisational capacity (support from IPP, own institution) ii. Wider networks	Other features and factors, e.g. a focus on GESIP, scoping demand, flexibility in the budgeting model Enablers or challenges in applying GESIP guidance to your innovation or research?
RESPONSES:			

TOPIC: 4. **Significance and uniqueness of GCRF funding**			
	Sub-topic	**QUESTIONS**	**PROMPTS**
1		Given the Covid-19 impacts AND funding cuts, to what extent do you think GCRF funding can be substituted? 1. What alternative sources of funding exist for this award/programme? 2. What aspects/interventions within the award/programme relied on GCRF funding? Are there alternatives? 3. What are the next steps for the award/programme, e.g. will you be pursuing a new funding strategy?	• Extent to which GCRF funding can be substituted • Additionality of knowledge funded by GCRF and whether the equivalent could be secured through other sources in same time frame/quality etc (in VfM rubric) • Interventions within awards and programmes that rely on GCRF funding/response to Covid-19

RESPONSES HERE:

Topic 5. **Lessons to inform improvements in the future delivery of the signature investments & promote learning across GCRF**			
	SUB-TOPIC	**QUESTIONS**	**PROMPTS**
1	Lessons for award holders Lessons for funders	1. What have been the key lessons learned for you as award holder/programme manager? 2. What improvements could future ODA project/programmes make?	
RESPONSES HERE:			

Annex 2b: Common codebook – Stage 1b

*Note: VfM-specific data needs are mapped in blue against this framework to show where these fit, but also to flag a request for looking at ***resource allocation to southern partners and rationale for this*** [sub-code 2.2: 'fairness to partners'].

PARENT CODE	SUB-CODE	DEFINITION/DESCRIPTION
1. Structures and processes in place to support challenge-led research with development impact, within signature investment awards and programmes	1.1 Selection and set-up processes	Presence of and description of the ToC/vision for the programme; information on how the call was defined and who was involved, and on how projects were selected and the review process (and who was part of that)
	1.2 Design and Implementation processes (ODA research excellence)	The ways in which, and the extent to which, development considerations are built into calls and proposals (gender responsiveness, poverty, social inclusion, equitable partnerships; relevance and local needs) (VfM: allocation of resources to LMIC partners)
	1.3 Management of the programme and awards	Any synergies or approaches to identifying synergies across the programme, or GCRF portfolio (coherence); management processes to ensure that development needs are met, reviewed and integrated (gender responsiveness, poverty, social inclusion, equitable partnerships; relevance and local needs); approach and flexibility of management processes in changing circumstances or with changing research/stakeholder priorities; any considerations of negative impacts of the research/process; monitoring and evaluation processes
	1.4 Capacity development	Approach to capacity strengthening – understanding capacity strengthening needs (and for who), and the extent to which, and how, capacity is being considered or approached; and what

		considerations are driving capacity strengthening (needs of LMIC/UK researchers)
	1.5 Engagement for delivering research	Approach to engagement with local researchers or other projects/programmes operating in the context, and with non-research stakeholders (coherence)
	1.6 Engagement with users	Any engagement with intended users of the research; stakeholder identification; targeting to user needs; dissemination strategies (for uptake)
2. Efficiency, proportionality and VfM of processes to support challenge-led research	2.1 Efficiency, proportionality of processes	Whether processes are efficient and whether they are (dis)proportionate to the scale/scope of funding or ambitions. Any reflections on whether the processes are cost-effective (or not)
	2.2 Fairness for partners	Processes that support (or not) LMIC partners VfM: allocation of resources to LMIC partners and rationale for this
3. Early progress towards desired outcomes/impacts	3.1 Key intended outcomes and achievements	Intended (ToC) results and outcomes (VfM: research knowledge-into-results)
	3.2 Key unintended outcomes and achievements	Unintended results and outcomes (VfM: research knowledge-into-results)
	3.3 Impact of Covid-19	Effects of the pandemic on delivery and results from the programme
	3.4 Impact of funding cuts	Effects of the spending review funding cuts on delivery and results from the programme
	3.5 Barriers within the context	Risks: in internal/institutional support for research; data availability; political environment and awareness of the challenge/issues; the need for research capacity strengthening (VfM: risks – identification and management)

	3.6 Enabling factors	Factors helping to overcome barriers and deliver outcomes e.g. research capacity; programme support; wider networks
4. Significance and uniqueness of GCRF funding	4.1 Alternative sources of funding	Other funding bodies, or programmes, supporting similar research
	4.2 Aspects unique to GCRF funding	What can't be replaced, e.g. in terms of funding scope or scale (VfM: 'additionality')
	4.3 Changes to funding strategy	Reflections on where funding may come from in the future to progress the research or support new research (if not GCRF)
5. Lessons to inform improvements in the future delivery of the signature investments & promote learning across GCRF	5.1 Lessons for award holders	Capturing any key lessons learned and improvements for future awards
	5.2 Lessons for funders	Capturing any key lessons learned and improvements for future programmes

Annex 2c: Assessment rubrics for EQs 1–4

Figure 10: Rubric for EQ 1

Evidence of alignment/misalignment with structures and processes that could be expected in a challenge programme/award			
Beginning: There are some indications that the programme is meeting a few of the management criteria but, overall, structures and processes are nascent or underdeveloped and unlikely to effectively support challenge-led R&I.	**Developing:** There are some indications that the programme is meeting several of the management criteria but, overall, structures and processes still need further strengthening to effectively support challenge-led R&I.	**Good:** There are several indications that the programme is meeting most of the management criteria and that, overall, structures and processes effectively support challenge-led R&I.	**Exemplary:** There are several indications that the programme is meeting almost all of the management criteria and that, overall, structures and processes are highly effective at supporting challenge-led R&I and put the award at the cutting edge of managing challenge R&I for development impact.

Figure 11: Rubric for EQ 2

Evidence of alignment/misalignment with structures and processes that could be expected in a challenge programme/award			
Beginning: There are some indications that the award is meeting a few of the capacity strengthening criteria but, overall, structures and processes are nascent or underdeveloped and unlikely to support effective R&I capacity strengthening in LMICs and the UK.	**Developing:** There are some indications that the award is meeting several of the capacity strengthening criteria but, overall, structures and processes still need further strengthening to support effective R&I capacity strengthening in LMICs and the UK.	**Good:** There are several indications that the award is meeting most of the capacity strengthening criteria and that, overall, structures and processes effectively support R&I capacity strengthening in LMICs and the UK.	**Exemplary:** There are several indications that the award is meeting almost all of the capacity strengthening criteria and that, overall, structures and processes are highly effective at supporting R&I capacity strengthening in LMICs and the UK, and put the award at the leading edge of capacity strengthening practice with LMIC partners and UK teams.

Figure 12: Rubric for EQ 3

Evidence of alignment/misalignment with structures and processes that could be expected in a challenge programme/award			
Beginning: There are some indications that award processes are efficient, proportionate, fair and offer potential for value for money, but, overall, structures and processes are nascent or underdeveloped to meet the criteria.	**Developing:** There are some indications that award processes are meeting the criteria – efficient, proportionate, fair and offer potential for value for money – but, overall, structures and processes require further strengthening to meet the criteria effectively.	**Good:** There are several indications that the award is meeting the criteria and that, overall, structures and processes effectively support efficiency, timeliness, proportionality and fairness for partners.	**Exemplary:** There are several indications that the award is meeting the criteria and that, overall, structures and processes are highly effective at supporting efficiency, timeliness, proportionality and fairness for partners, and put the award at the leading edge of practice with LMIC partners and UK teams.

Figure 13: Rubric for EQ 4

Evidence of alignment/misalignment with structures and processes that could be expected in a challenge programme/award			
Beginning: There are some indications that the award has made some progress to its ToC but, overall, progress is at an early stage (reflect on whether this is as expected or faster/slower than expected, and why).	**Developing:** There are some indications that the award is progressing along its ToC and meeting early milestones, but further efforts are needed to build up progress to meet as anticipated in the ToC and to ensure that it is well supported and adaptive (reflect on whether progress is as expected or faster/slower than expected, and why).	**Good:** There are several indications that the award is progressing well along its ToC, is meeting milestones as anticipated and adapting well to unanticipated outcomes and Covid-19, and that progress is well supported (reflect on whether progress is as expected or faster/slower than expected, and why).	**Exemplary:** There are indications that the award is surpassing expectations of progress along its ToC, is meeting milestones and adapting well to unanticipated outcomes and Covid-19, and that progress is well supported and puts the award at the leading edge of performance.

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