

## **Section A: Official Development Assistance (ODA) and GCRF strategy**

### **The strategy**

1. Summarise the key aspects of your three year **strategy for development related and GCRF research activity**, including:
  - a. Your institution's strategy and priority objectives for all development related research activity funded through all sources for three years from 2018-19.
  - b. A summary of the key aspects of your three year strategic plan for QR GCRF, in light of the criteria and objectives for the GCRF outlined in the guidance.
  - c. How activity funded through QR GCRF fits into your broader strategy and priorities for all development related research activity.
  - d. How activity funded through QR GCRF relates to the UK strategy for the GCRF.<sup>1</sup>
  - e. How your development-related and GCRF strategies relate to your wider institutional strategy for using QR.
  - f. Likely key barriers and enablers to implementing your strategy.
  - g. The key activities by which you will realise your objectives, such as capacity and capability building; mono-disciplinary, interdisciplinary and collaborative research; generating impact from research; meeting the full economic cost of GCRF activity funded through other sources; rapid response to emergencies with an urgent research need; and pump priming.
  - h. The main developing countries, included in the Development Assistance Committee (DAC) list, which you intend to collaborate with.

Maximum 3,000 words

#### **(a) Institutional Strategy**

Research informed by the needs of society, and research programmes co-created with the intended beneficiaries, are at the heart of Brunel's activity as an institution. The new GCRF research activity provides an opportunity to grow our volume of development related research activity. We will seek to do that in areas where we are internationally competitive, and where we have our unique expertise, research methodologies, facilities and partnerships. This will allow us to build research programmes that are both academically excellent but also lead to maximal public benefit.

---

<sup>1</sup> UK Strategy for the Global Challenges Research Fund,  
<http://www.rcuk.ac.uk/funding/gcrf/challenges/>

The Global Challenges Research Fund aims to support excellent research that addresses the challenges faced by developing countries, through challenge-led disciplinary and interdisciplinary research, strengthening capacity for research and innovation within developing countries and the UK and providing an agile response to emergencies where there is an urgent research need.

RCUK has developed a 'vision for change' and a research agenda around three key areas, aligned to the UK Aid Strategy and the UN Global Goals for Sustainable Development (SDGs). These are:

Equitable Access to Sustainable Development	<ul style="list-style-type: none"> <li>• Secure and resilient food systems supported by sustainable marine resources and agriculture</li> <li>• Sustainable health and well being</li> <li>• Inclusive and equitable quality education</li> <li>• Clean air, water and sanitation</li> <li>• Affordable, reliable, sustainable energy</li> </ul>
Sustainable Economies and Societies	<ul style="list-style-type: none"> <li>• Sustainable livelihoods supported by strong foundations for inclusive economic growth and innovation</li> <li>• Resilience and action on short-term environmental shocks and long-term environmental change</li> <li>• Sustainable cities and communities</li> <li>• Sustainable production and consumption of materials and other resources</li> </ul>
Human Rights, Good Governance and Social Justice	<ul style="list-style-type: none"> <li>• Understand and respond effectively to forced displacement and multiple refugee crises</li> <li>• Reduce conflict and promote peace, justice and humanitarian action</li> <li>• Reduce poverty and inequality, including gender inequalities</li> </ul>

Our strategy will contribute to this agenda. It builds on some significant achievements to date, projects secured and existing plans to bid for GCRF funding from other delivery

partners, particularly, EPSRC, RCUK and Innovate UK. Brunel has had more awards from Innovate UK under the Newton Fund initiative than any other UK institution. In addition, two Brunel-led proposals have been short-listed through to the full proposal stage of the GCRF competition to establish Interdisciplinary Research Hubs to Address Intractable Challenges Faced by Developing Countries. Brunel is investing considerably in developing the Hubs – the Plastics in Society Hub will work with collaborators in India, Indonesia, Malaysia, South Africa and Thailand to create the methodologies and technologies to address plastic pollution in the Indian Ocean region and to create a fully circular plastics economy. The Sustainable Protected Horticulture Hub will work with collaborators in India, Kenya, Tanzania and Uganda to develop sustainability technologies in all parts of the food chain.

A significant achievement was winning the first ever UK Newton Prize in 2017 for the Newton-Bhabha APEX-II research project. Announced by Jo Johnson in November 2017, the Prize 'recognises excellent research and innovation in support of economic development and social welfare in Newton Fund partner countries'. The APEX-II project, led by Brunel and the UK and the Indian Institute of Technology in India, is developing advanced solar power technology to supply clean, sustainable and affordable energy to villages across India. <https://www.epsrc.ac.uk/newsevents/news/newtonprizeindia/>

Projects secured by Brunel since 2016 for ODA compliant research and knowledge exchange activities are identified in the table below, organised by country/region and identifying the relevant GCRF challenge area.

Africa		
Project	Funder	GCRF Challenge Areas
Development of an artificial snail to reduce the risk of human infection to Schistosomiasis	Bill and Melinda Gates Foundation	sustainable health and well being
Education systems, aspiration and learning in remote rural settings	ESRC-DFID	inclusive and equitable quality education
Social cash transfers, generational relations and youth poverty trajectories in rural Lesotho and Malawi	ESRC-DFID	inclusive and equitable quality education
Non-Active Power Compensators: Implementations and Implications	The Royal Academy of Engineering - Newton	affordable, reliable, sustainable energy
Newton Mosharafa Visiting studentship	British Council - Newton	affordable, reliable, sustainable energy
Design and innovation tools to support SMEs in developing sustainable Product-Service Systems for energy access in Africa contexts	EPSRC Global Challenges Research Fund	sustainable production and consumption of materials and other resources
Brazil		

Drying Technology for Mate tea industry	Innovate UK – Newton	inclusive economic growth and innovation
<b>China</b>		
Probabilistic State-Constrained Optimal Control for Key Performance Indicators in Large-Scale Industrial Plants and its Application to Hot Strip Mill Process	Royal Academy of Engineering - Newton	inclusive economic growth and innovation
Advanced Automotive Turbomachines for Boosting Exhaust and Waste Heat Energy Recovery	The Royal Academy of Engineering – Newton	affordable, reliable, sustainable energy
Enabling a More Reliable Smart Grid with Big Data	The Royal Society- Newton	affordable, reliable, sustainable energy
Emission prediction and control of industrial combustion devices	EPSRC Global Challenges Research Fund	affordable, reliable, sustainable energy
<b>India</b>		
Bio-based Packaging for Fresh Food	Innovate UK – Newton	sustainable production and consumption of materials and other resources
International workshop and symposium on Perovskite and Hybrid solar cells	British Council -Newton	affordable, reliable, sustainable energy
Vulcanair; contributing to lower carbon dioxide emissions and cleaner air in cities	EPSRC Global Challenges Research Fund	clean air, water and sanitation
Miniaturised solar concentrators for water desalination/purification	UKIERI	affordable, reliable, sustainable energy



<b>Kazakhstan</b>		
Multi-dimensional environment-health risk analysis for Kazakhstan	British Council -Newton	sustainable health and well being
Resilient Structures and Infrastructure	British Council - Newton	sustainable cities and communities
Water management and environmental impact assessment in the oil and gas industry	British Council - Newton	clean air, water and sanitation
Benchmarking industrial risk regulations and management in Kazakhstan	EPSRC Global Challenges Research Fund	inclusive economic growth and innovation
<b>Mexico</b>		
Exploring the Potential of Utilising Waste for Public Road Transport	The Royal Academy of Engineering – Newton	sustainable production and consumption of materials and other resources
<b>Philippines</b>		
Low-cost Portable Molecular Diagnostic Platform for Rapid Detection of Poultry Infectious Pathogens	BBSRC-Newton	secure and resilient food systems
<b>Turkey</b>		
Multimodal Emergency Guide System for Elderly	Royal Academy of Engineering - Newton	sustainable cities and communities
Advanced biological wastewater treatment processes	The Royal Society – Newton	clean air, water and sanitation
The use of physical barriers to reduce saltwater intrusions in coastal aquifers	Royal Academy of Engineering - Newton	clean air, water and sanitation

Investigation of using strain hardening fibre reinforced cementitious matrix from polymer fibre and natural fibre for seismic retrofit to masonry structures	EPSRC Global Challenges Research Fund	resilience and action on short-term environmental shocks and long-term environmental change
<b>Multiple partner countries</b>		
Cool Materials - High Tech/Low Cost solution for energy efficiency and thermal comfort in low rise buildings in high solar radiation countries  - Jamaica, Ghana, Brazil	EPSRC Global Challenges Research Fund	affordable, reliable, sustainable energy
Plastics in Society  - Indonesia, India, South Africa	Plastic Oceans Foundation	sustainable production and consumption of materials and other resources

Within this context, our strategy is to further realise Brunel's global responsibility objectives in support of UK government aid strategy and the UN Sustainable Development goals. We will seek to do this by increasing support for research on global challenges and development, enhancing our understanding and capacity to undertake complex, interdisciplinary development research and building partnerships with organisations in developing world countries to co-create and jointly address global, development needs through research cooperation, networking and knowledge sharing.

#### **(b) Key Aspects of our Strategic Plan for QR GCRF**

Our plan has three strategic foci:

1. Building our capacity to address developing world problems and help to increase the internationalisation our research activity.
2. Building research networks and partnerships with developing world countries.
3. Accelerating the impact of Brunel's research in developing countries.

#### **(c) Connection to our Broader Strategy**

The GCRF strategy intersects with our existing strategy in three ways.

Firstly we wish to grow the research in areas where we are strong, drawing researchers from across the institution to work on multi-disciplinary projects that address societal or industrial challenges. To facilitate this process, in 2014 we established three multi-disciplinary research institutes, Energy Futures, Environment Health & Societies and Materials & Manufacturing. Nearly two-thirds of our faculty are members of these Institutes, drawn from every discipline in the institution. We will use this structure to support and enhance our multi-disciplinary GCRF research activity, building more agile multi-disciplinary teams to do research that promotes economic development and welfare in developing countries.

Secondly we have a strategic objective to increase the international dimension to our research. Brunel has a strong tradition of internationalisation. It is listed as the 24th 'most international' university in the Times Higher Education 2018 list of the world's most international universities: 20% of Brunel's student population are from overseas. The University is entering a new phase of international activity with ambitious targets which reflect our commitment to enhancing our international reputation. We aspire to be *London's international university* with a multicultural community of students and staff, and provide a supportive environment and educational experience that prepares students as global citizens. Our international focus pervades institutional priorities, resource and development choices and ensures that international dimension is considered in all our policies, strategies and processes. Much of our research is performed with international partners; over the last three years 55% of our research outputs had an international co-author. However the technological and applied focus of much of our research has meant that a low volume of our research has been in partnership with, or focused on the needs of, developing countries. Thus this initiative is a valuable opportunity to develop new partnerships with universities and industries in developing countries and to co-create new research programmes with them.

Thirdly, our strategy informs our curriculum development. We have already launched an innovative Bachelor of Arts and Sciences (BASc) degree in Global Challenges which has been designed to address the growing need for graduates that have a broad understanding of the multiple scientific, social, political and economic factors that impact on decision making, communication and design in a variety of contemporary global landscapes. Taking a transdisciplinary approach, the programme introduces students to mixed method research approaches from across the arts, natural and social sciences, with specialisms in Planetary Health, Security, Social Cohesion and Global Innovation. Similarly we have just launched new degrees in Flood and Coastal Engineering in partnership with HR Wallingford and the Environment Agency. These allow students to study at Foundation, undergraduate and Master's levels to build careers in government bodies and NGOs protecting communities against flooding.

#### **(d) Relation to the UK Strategy for GCRF**

Our approach to GCRF mirrors the UK strategy by supporting a diverse but balanced portfolio of activities, that will be problem and solution focussed, addressing the UN

Sustainable Development Goals and maximising the societal benefit. Most of our investment will create new knowledge and drive innovation to create more **equitable access to sustainable development** by increasing access to:

secure and resilient food systems,  
sustainable health and well-being,  
clean air, water and sanitation,  
affordable, reliable and sustainable energy.

We will also contribute to creating more **sustainable economies and societies** by carrying out research and innovation that creates:

sustainable cities and communities,  
sustainable production and consumption of materials.

All investments will meet the guidelines and criteria set out in the UK strategy. They will be made in ODA compliant activities, namely in excellent research, capacity building and innovation activities that promote the economic development and welfare of a developing country or countries as its primary objective.

#### **(e) Relation to our institutional strategy for QR**

Our mainstream QR is used to support the academic base and new investments are determined on the basis of strategies developed at Departmental and College level. In a similar way, our approach to GCRF identifies three strategic foci, under which disciplinary grounded projects can be funded, that both support the disciplinary research strategy, whilst building critical mass and capacity around the industrial and global challenges identified within the Research Institutes.

#### **(f) Key Barriers and Enablers to Implementation**

The key barrier is our current lack of research volume with developing countries, and hence a relative shortage of collaborators in those countries. We seek to overcome this with a strategic focus on the investment of QR GCRF funding in, and development of, institutional research networks and partnerships with developing countries.

There are three principal enablers. The first are our Research Institutes, which were created and built to facilitate and support research programmes such as development related and GCRF research activity. The second is that much of our technological research is focused on sustainability, particularly the circular economy, waste valorisation, advanced materials, materials processing and efficient energy distribution and recovery. These are all technologies with the potential to address the environmental and sustainability challenges of developing countries, and where the development of these technologies in-country is capable of increasing employment and productivity and creating prosperous economies. The third is the extremely diverse, international nature of Brunel's academic staff population which provides a network of strong personal contacts across many DAC listed countries.



## **(g) Key Activities**

Aligned to our strategic foci, our approach has activities in the three areas.

### **1) Support for research fellowships**

We will support the recruitment of new research fellowships in areas aligned to our research strengths and areas of growth, to build capacity to address problems in developing countries and help to internationalise our research activity.

We will create four new Global Challenges Research Fellowships to attract excellent researchers, whether from the UK or overseas, with relevant expertise in areas of global development challenges, working in fields that complement and support our areas of research specialism. These posts will be offered as senior, fixed term appointments with potential to become permanent, subject to successful completion. The appointments will enable us to engage more effectively in global challenges research by building our capacity in areas where we are already active and by enabling us to align existing research activities towards ODA aims.

The Fellowships will be advertised internationally and will be offered in the following areas:

**Social and behaviour change** – understanding behaviour change interventions for improved public health and social cohesion in the developing world.

(aligned to RCUK themes: sustainable health and well-being, sustainable cities and communities)

**Sustainable energy for developing countries** – low cost, energy efficient technologies.

(aligned to RCUK themes: affordable, reliable and sustainable energy; secure and resilient food systems)

**Circular economy and sustainable development** – management of natural resources for climate change mitigation and resilient economic growth.

(aligned to RCUK theme: sustainable production and consumption of materials)

**Global Flood Risk and Resilience** – developing understanding of flood risk, mitigation and adaptation for clean water and sanitation in developing world countries.

(aligned to RCUK theme: clean air, water and sanitation)

The Fellows will be integrated into the Research Institute structure through membership of one of the Themes. They will each be mentored and supported by a senior Professor who will help them to embed into the role and to expand their networks. They will engage in high-quality ODA compliant research activity, lead research projects and initiatives, contribute to raising the profile of global challenges research, building our portfolio of research activity addressing development challenges through collaboration with

colleagues and international partners and contribute to the development of research strategy. Working as a cohort, they will be expected to make a significant impact through the generation of original and impactful knowledge and understanding of direct benefit to communities in developing world countries, and to its application through extensive collaboration and knowledge exchange.

## **2) Support for building research networks and partnerships**

A priority will be to support the building of more strategic relationships with developing world countries, focused on links with a key regional university partner that can act as a gateway to other HEIs, organisations and businesses in the area. This approach will enable the development of more deeply embedded and multi-faceted partnerships with reduced transactional costs for both sides, and the establishment of strong collaborative networks with international researchers and non-academic stakeholders to position for future ODA-relevant research applications. It will also strengthen our understanding of international development challenges through the exchange of knowledge and skills with academic partners and wider stakeholders.

This will mainly be achieved through four mechanisms:

- 1) We will identify one or two partner universities in key priority regions, including Brazil, India, Indonesia and Africa and will arrange high level visits to establish institutional partnerships.
- 2) We will develop a GCRF Visiting Expert seminar programme, inviting academics, specialists and practitioners in international development to present on aspects of global challenges research to build our understanding of the related challenges.
- 3) We will support future research leaders to develop GCRF/ODA focused research networks bringing together researchers from across disciplines and from developing countries and the UK to hold networking events, to forge new links and generate innovative transdisciplinary research ideas to address global challenges.
- 4) As part of an initiative by the Association of Commonwealth Universities (ACU) to develop institutional capacity for supporting research, we will lead a group, along with the Universities of Kent, Leicester and SOAS, to deliver professional development events for key staff who support research and innovation in African universities. Working with and supported by the Southern, West, East and Central African Research Management and Innovation Associations, the main professional networks in the region, we will contribute to the development and delivery of training activities at their annual conferences. This initiative is also supported by and complements the work of The Wellcome Trust and African Academy of Sciences, who are currently developing an African-led initiative to develop research management systems on the continent.

## **3) Accelerating the impact of Brunel's research**

Our third main area of activity will focus on accelerating the impact of our research on developing countries through knowledge exchange to enable innovation in an international development context in DAC listed countries. We will provide flexible funding to academics to add value to existing global challenge research activities and generate a wide range of outputs, outcomes and impacts in an international development context.

Funding will be awarded via an internal competitive process open to all Brunel academics. It will support activities that enable impact to be generated more effectively or accelerated, including where necessary to provide a speedy response in emergency situations, through visits, exchanges, secondments and small development projects in collaboration with universities, charities and companies in DAC listed countries. These would be in areas where our knowledge and technologies could be harnessed to deliver sustainable social and economic benefit and hence increase economic development and wellbeing in developing countries.

#### **(h) Main Collaborating Countries**

Our main collaborating countries include, but are not restricted to

Least developed countries: Tanzania, Uganda

Low income countries: Kenya

Lower Middle Income Countries: India, Indonesia, West Bank and Gaza Strip,

Upper Middle Income Countries: Brazil, China, Colombia, Kazakhstan, Lebanon, Malaysia, South Africa, Thailand, Turkey

## **2. Provide details of the main intended **outcomes and impacts** of your strategy.**

Overall, we want the QR GCRF funding to help grow, long-term, our volume of research with, and for the benefit of, developing countries. We will measure this outcome through the number of additional projects funded with developing country partners, the volume of research grant income won and the number of papers co-authored with partners from developing countries. Similarly we will measure the impact of our research in this area

through the number of technologies deployed, job created and companies supported in developing countries as well as the number of impact case studies generated.

### **Management of GCRF**

3. How will your HEI **monitor** and **evaluate** its progress and compliance in ODA and GCRF activity, including assessing geographical distribution of activity, outputs, outcomes and economic and social impacts?

Please describe the policies, procedures and approach you have in place to measure progress, evaluate outcomes, identify lessons learned, and ensure ODA compliance.

The monitoring and evaluation of our GCRF activity will be undertaken by a group of senior academics, chaired by the Deputy-Vice-Chancellor (Research and Innovation), and comprising the 3 Deans of College and 3 Directors of Research Institutes and advised by the Director of Research Support and Development and the Chief Finance Officer. This group will report in writing termly to Research Strategy Committee and then to Executive Board. The Group will oversee decisions on investments, and then measure progress and outcomes, identify lessons learned and ensure ODA compliance, whilst also overseeing the reporting required to HEFCE, Research England and any other bodies.

Within our three strategic foci investments, projects and activities will be selected on the basis of competitive peer review in order to ensure that our investments are both underpinned by research excellence but also likely to maximise the impact on the wellbeing of people in developing countries.

An entry on non-compliance with ODA and GCRF criteria has been placed in the University risk register.

### **Section B: Use of QR GCRF 2018-19 allocation and future QR GCRF priorities**

4. Please complete the table in Annex A2 detailing the expected spending and activities for QR GCRF in the academic year 2018-19. Note that the total QR GCRF spending must equal the indicative allocation (available in Annex C), and all activities must be ODA-compliant for strategies to be assessed as ODA-compliant overall.
5. Please add here any explanatory notes on how you have completed the table in Annex A2 that will help inform assessment of ODA compliance.

Maximum 200 words

The table shows the three key foci of our strategy and the proposed breakdown of the budget between the three areas. Total income received by Brunel for ODA compliant activities from RCUK, Innovate UK, the British Council, Royal Academy of Engineering, UKIERI and other charities are shown against each focus area. The expected beneficiary countries and key outputs from the QR GCRF activities are identified, subject always to future appointments and awards made.

6. How would your **priorities and activities** for 2018-19 QR GCRF change if the funding level differs from that outlined in indicative allocations? Please include detail of how priorities will change with increases and decreases to QR GCRF funding, and details of how each priority meets ODA criteria.

Maximum 500 words

Our priorities for 2018-19 are to establish the four Global Challenges Research Fellowships and to initiate the partnership development activities. We will work at all times to ensure that all partnerships are equitable.

Activities will focus on recruiting partners (universities, charities and/or companies) and co-creating plans for research projects with these partners that are fully informed by the local context in the DAC country partners and reflect evidenced needs and challenges. Towards the end of the year the project initiation will begin.

Networking and partnership building will centre initially on institutions with whom we have existing relationships in DAC listed countries, identified as part of our on-going international strategy development programme. In addition the Global Challenges Research Fellows will receive funding to pump-prime the development of partnerships and collaborations to support activities aligned to their research priorities. We will deliver two Visiting Expert workshops to raise awareness and disseminate information and best practice on aspects of development research. During 2018-19, we will also work with the ACU and UK and African partners to develop a capacity building programme for African colleagues working in research and innovation support.

An application process will be developed and promoted for the impact acceleration funds, with an emphasis on supporting existing projects, through wider engagement, take up or translation of research outcomes to different DAC listed countries. These funds will be allocated on a competitive basis.

If funding levels were increased, we would look to support an additional Fellowship, depending on the amount available, or to top up the funds for partnership initiation. If funding were to decrease, we would reduce the amount allocated for impact acceleration.

7. Based on indicative funding allocations, what are your **priorities** for QR GCRF activity in 2019-20? Please include detail of how priorities will change with increases and decreases to QR GCRF funding, and details of how each priority meets ODA criteria.

Maximum 1,000 words

Our priorities for QR GCRF activity in 2019-20 will be to continue to support the Global Challenges Research Fellowships. Funding will support the salaries of the Fellows, appointed during 2018, and associated expenses.

Activities will focus on working with the partners to implement the research, which will vary between projects. Activities will include community action activities, data collection from, and interviews of, human participants, co-creation and evaluation of communication material, co-creation of new technologies or the roll out of a new or improved technology into a particular country, region or community, adapted to the local need in the recipient society. A priority will also be to identify and apply for relevant sources of funding to support research, capacity building and knowledge exchange activities.

We aim to have formalised strategic collaborations with at least 3 universities in DAC listed countries, involving collaboration and knowledge exchange across our respective faculty. The Global Challenges Research Fellows will continue to be supported to build and extend their international networks, in particular with a view to developing and submitting joint applications for funding. Awards will also be made on a competitive basis to a small number of future leaders of global challenges research to support network building in DAC listed countries. We will also co-deliver at least two capacity building training programmes for African research and innovation staff with ACU and other UK partner universities, and three further Visiting Expert workshops.

We will deploy and monitor impact acceleration funding where needed to ensure that the research of the GCRF Fellows is applied more quickly and effectively for the benefit of local communities and populations, or to address emergencies and other arising circumstances where a rapid turnaround might be required.

If funding levels were increased, we would look to support an additional shorter Fellowship, depending on the amount available, possibly to enhance and develop one of the existing projects, or to support a GCRF specialist support post. If funding were to decrease, we would reduce the amount allocated for impact acceleration.

8. Based on indicative funding allocations, what are your **priorities** for QR GCRF activity in 2020-21? Please include detail of how priorities will change with increases and decreases to QR GCRF funding, and details of how each priority meets ODA criteria.



Maximum 1,000 words

Our priorities for QR GCRF activity in 2020-21 will be to continue to support the Global Challenges Research Fellowships. Funding will support the salaries of the Fellows, appointed during 2018, and associated expenses.

Activities will focus on the dissemination of the research to stake-holders, as well as evaluations of the work done. This will allow for the spread of best practice, or the piloting or scale-up of the activities in the same country or region, or in other DAC listed countries.

If funding levels were increased, and depending on plans for continuation of QR GCRF funding, we would look to support an additional Fellowship, or to support a GCRF specialist support post. If funding were to decrease, we would reduce the amount allocated for networking and partnership building.