



RAEng Responses
CAETS Discussion Group: Sustainable Development Goals
Monday, 10 September 2018
3:34 pm – 5:45 pm

Potential Questions regarding Engineering and the Sustainable Development Goals:

1.) Does your academy have efforts underway relating to the sustainable development goals? If so:

- **What is your focus?**
 - Supporting Engineering Entrepreneurship
 - Capacity building for researchers in the UK and in developing countries who are tackling global challenges
 - Creating Interdisciplinary networks
 - Bridging the gap between Industry and Academia
 - Strengthening engineering institutions in Sub Saharan Africa
- **Are you working in collaboration with other organizations?**
 - Funding partners, including government ministries and corporates
 - Engineering institutions
 - Universities, governments and embassies in partner countries.
 - Third sector organization

2.) Does your country have a coordinated effort to contribute to achievement of the SDGs?

The UK government is committed to spending 0.7% of GNI on Official Development Assistance. We are a delivery partner for two large programmes funded by the Department for Business Energy and Industrial Strategy, detailed below:

Global Challenges Research Fund - a £1.5 billion fund announced by the UK Government in late 2015 to support cutting-edge research that addresses the challenges faced by developing countries. Alongside the other GCRF delivery partners we are creating complementary programmes that:

- 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.

The Newton Fund aims to promote the economic development and social welfare of either the partner countries or, through working with the partner country, to address the wellbeing of communities. It will do so through strengthening partner country science and innovation capacity and unlocking further funding to support this work. was launched in 2014 and originally consisted of £75 million each year for 5 years. In the 2015 UK Spending Review it was agreed to extend and expand the Fund. The Newton Fund was extended from 2019 to 2021 and expanded by doubling the £75 million investment to £150 million by 2021, leading to a £735 million UK investment to 2021, with partner countries providing matched resources within the Fund. The Newton Fund covers three broad activities:



- **People:** increasing capacity in science and innovation, individually and institutionally in partner countries
- **Research:** research collaborations on development topics.
- **Translation:** creating collaborative solutions to development challenges and strengthening innovation systems.

3.) How would you prioritize the SDGs in terms of the potential contributions from engineering and the technological sciences?

The Royal Academy of Engineering feel that engineering is absolutely critical to achieving the United Nations Sustainable Development Goals, and that the engineering profession should be taking a leadership role in this area. The Royal Academy of Engineering, CAETS 2016: Engineering a Better World conference was focused on highlighting this role both to the engineering community, and the international development community. One of the communications pieces developed for this conference was a thought leadership publication outlining how engineering is vital to achieving each, individual.

When approaching tackling the SDGs one of the most important topics in the eyes of RAEng is that of interdisciplinarity. The SDGs cannot be seen as mutually exclusive; they are connected in a myriad of ways and activity that is undertaken in the name of achieving one goal can have several other impacts elsewhere. Achieving the SDGs is also going to take every community coming together, for example, engineers working with social scientists and medical scientists.

4.) Recent CAETS technical programs have focused on topics directly related to the SDGs, and the broad theme “Engineering a Better World” is well-aligned with the aims of the SDGs.

- **Should we develop a communications program to call attention to the role of engineering in achieving the SDGs?**

We need to increase awareness of the role of engineering in achieving the SDGs and CAETS adopting the ‘Engineering a Better World’ brand name was one way of doing this. Developing a communications programme across CAETS would require significant resources, and multiple national and regional contexts could pose a difficulty.

We could share examples of communications campaigns that have worked well in achieving the goal of communicating the role of engineering in the SDGs. We also think that a good first step could be for each Academy, or those that would like to, to group their policy reports under relevant SDGs, as a way of showcasing the work many Academies will already be doing in this area. Reports could also be group according to the SDG which is their primary focus, and also tagged with further SDGs which are relevant.

- **Should we develop partnerships with other organizations working in this space? (e.g. World Federation of Engineering Organizations, InterAcademy Partnership, etc)**



Partnerships can be very beneficial in allowing a more diverse exchange of ideas and opinions, and in helping achieve objectives. However, our main concern with forming partnerships with other organisations is that we must always be asking ourselves whether this is going to increase our impact as a network. Do the other organization bring with them expertise, resources, or networks that we don't have?

5.) What are the next steps?

Policy reports are a clear next step as a way of collating the knowledge, data and recommendations that exist within the global engineering community. They could be used as a means of reinforcing the SDGs and communicating the global engineering community's support for them to Governments and other institutional bodies.

Royal Academy of Engineering Background Information

International Programmes and Activities – Newton Fund

Industry Academia Partnership Programme (IAPP)

- IAPP creates science, innovation and research partnerships between the UK and emerging countries, facilitating knowledge-sharing and encouraging cross-border collaborations on global challenges.
- The programme brings local industry experts and UK academics into universities in emerging countries to redesign course content and review teaching methodologies, giving academics in emerging markets access to world-class expertise.
- The programme also builds the skills base and improves the employability of students by giving them the opportunity to work on real-life engineering challenges, on topics including advanced manufacturing and big data, by working in partnership with local industry and UK academia.
- The collaborations are designed to generate new technologies, methodologies and industrial processes targeted at solving local development challenges, while also improving engineering education.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/industry-academia-partnership>

Leaders in Innovation Fellowship (LIF)

- LIF empowers academics and researchers in emerging markets, LIF Fellows, to commercialise their research or innovations by providing them with a focused period of tailored training, access to expert mentors and regional and international networking opportunities, to encourage entrepreneurship.
- Following the training, the programme supports the development of these economically-sustainable ventures by providing LIF Fellows with ongoing support from the partnering institutions in their home country and networking opportunities with regional and international peers.



- To date, the LIF programme has provided support to approximately 750 entrepreneurs across 16 Newton eligible countries.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/leaders-in-innovation-fellowships>

UK-China Urban Flooding Research Impact Programme

- Under its remit as a Delivery Partner in the UK-China Newton Fund, the Academy is partnering with the Chinese Academy of Engineering to implement the UK-China Urban Flooding Research Impact Programme.
- This Programme aims to support impactful research and enhance the impact of existing research in Urban Flooding in both countries by encouraging bilateral collaboration between academics and government as well as wider industry. It was informed by presentations and discussions held within the China-UK Urban Flooding Symposium on 16-17th October 2017. The deliberations exposed a clear need to increase flood resilience in both the UK and China and in both cases this needs to be a cross disciplinary effort, with a need for collaborative learning across research, municipalities and governments at national, regional and local scales.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/uk-china-urban-flooding-research-impact-programme>

International Programmes and Activities – Global Challenges Research Fund

Africa Prize for Engineering Innovation

- The Africa Prize supports entrepreneurs to achieve commercial success from innovations focused on solving local challenges.
- The prize provides entrepreneurs with bespoke six-month business training and mentoring and regional networking opportunities, to enable them to turn ideas and prototypes into scalable and profitable businesses with genuine economic and social impact.
- Since 2014, an active alumni of 40 individuals and small teams from 10 countries across the continent have received training and mentoring.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/africa-prize>

Higher Education Partnerships in sub-Saharan Africa (HEPSSA)

- HEPSSA improves the quality of teaching in higher education institutions in sub-Saharan Africa through collaborations with local industry and UK academia.
- The programme provides funding to 'hub' universities in the region to enable two-way work placements; of teachers into industry to provide them with hands-on local engineering experience, and of industry partners into academia, to enable them to mentor students, deliver workshops and advise on curriculum updates. The insights and learnings from these secondments are then shared more widely with 'spoke' universities in the region via a series of knowledge-sharing workshops.
- The hub university also partners with a UK university, which provides expertise specific to the university's need. The UK role could include: curriculum reviews, staff exchanges, training staff and joint research projects.



- There are currently nine active hub universities working with a total of 55 spoke universities across 16 countries.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/higher-education-partnership-sub-saharan-africa>

GCRF Africa Catalyst

- GCRF Africa Catalyst establishes connections between professional engineering bodies in Sub-Saharan Africa (SSA) and UK universities and NGOs to increase engineering capacity and drive sustainable development in SSA.
- The programme provides grants to professional engineering bodies to undertake projects designed to tackle specific local needs – from developing the framework for student work placements through to improving the management capabilities of PEIs.
- Over the course of the next three years, GCRF Africa Catalyst will also develop research that maps engineering capacity and diversity in the region and explores how professional engineering bodies can help drive social and economic development.

Frontiers of Engineering for Development (FoEDev)

- FoEDev convenes interdisciplinary emerging leaders to build the capacity of the global research community to engage in engineering for development.
- The events bring together a wide range of attendees – from NGOs working in international development through to engineers across all disciplines – to encourage holistic approaches to international development.
- The events centre on pressing development challenges, such as sustainable farming and the circular economy, and are chaired by leaders in their fields.
- Participants can also apply for seed funding to progress some of the best ideas established at the event.
- www.raeng.org.uk/foe

Frontiers of Development (FoD)

- FoD convenes interdisciplinary emerging leaders from across the world – including engineers, local and international policy makers and medics – to build the capacity of the global community to engage in, and collaborate on, international development challenges.
- The events centre on pressing development challenges, and bring together top leaders in these fields to chair the events. Recent events have looked at “Inclusive Prosperity and Wellbeing in the Context of Mass Displacement” and “Inclusivity & Wellbeing: Coastal Communities in a 3°C World”
- Participants can apply for funding to enable them to continue the relationships established at the event, to encourage further collaboration.
- *NB: the event is run by the four Academies: RAEng, The Royal Society, The Academy of Medical Sciences and the British Academy of Humanities and Social Sciences.*
- www.raeng.org.uk/fod



General International Activity

Engineering a Better World (EABW)

- EABW inspires the next generation of engineers to use their engineering backgrounds to tackle some of the world's most pressing development challenges.
- The programme curates and creates research and thought leadership content focused on global challenges.
- The programme also provides opportunities for students to participate in engineering for sustainable development in the early stages of their career through summer work placements with innovators in developing countries.
- <https://www.raeng.org.uk/policy/international-policy-and-development/gcrf-international-development/engineering-a-better-world-caets-2016>
- **Case study:** In 2016 the Academy created a 'Because Engineering' film featuring Bill Gates and Yahoo! CEO Marissa Meyer to demonstrate the profession's wide-reaching impact across all areas of life - from farming to sanitation. This was watched over half a million times in the weeks following its launch and was viewed in over two million Facebook newsfeeds. Watch it here: <https://www.raeng.org.uk/policy/international-policy-and-development/gcrf-international-development/engineering-a-better-world-caets-2016/videos/because-engineering>

Global Grand Challenges

- Global Grand Challenges convenes students and early-stage engineers to address some of the biggest issues facing current and future generations.
- It brings together global experts from different engineering disciplines to highlight the central role engineering has in driving societal change, and to better equip the audiences with an awareness of how to effectively tackle global grand challenges.
- <https://www.raeng.org.uk/policy/international-policy-and-development/global-grand-challenges>

Case Studies – Human Stories

Engineers having wider development impact

- In 2017, a Nigerian systems engineer, Godwin Benson, won the Africa Prize for Engineering Innovation. He designed Tuteria, an online platform that links students to qualified tutors in their area and within their budget. Users find the skill they want to learn on an app on their phone, set their budget, and wait to be connected to the nearest tutor. Both students and teachers are thoroughly vetted before being allowed to use the platform. The scope of skills on offer ranges from academic subjects, learning to play the piano, sew clothes, learn a new language and more.
- Head judge Malcolm Brinded CBE FEng has said "Godwin Benson's Tuteria invention changes the way Nigerians – and Africans – share knowledge and skills with one another...we trust Tuteria will go on to change the lives of millions of people who are eager to learn and develop new skills".
- This technology is a prime example of how engineering stretches broadly across the SDGs to have a development impact, and in innovative ways. Goal 4 (Quality Education)



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and Goal 8 (Decent Work and Economic Growth), upon first glance, may not seem like a natural home for engineers, but Godwin Benson's example demonstrates otherwise.

Engineering skills being sought to solve development challenges – Frontiers of Development

- Frontiers of Development Participant from Sierra Leone was one of two Psychiatrists in the entire country. His goal is to establish equitable health systems in the country which fully integrate mental health. To ensure that such a system would be truly accessible to all areas of the country he is looking to telemedicine and technology to help healthcare reach the most vulnerable, rural and disadvantaged populations.

- Stephen's work is primarily geared towards Goal 3 (Good Health and Wellbeing) and Goal 10 (Reduced Inequalities) though he came to our Frontiers of Development event looking to collaborate with engineers other disciplines to fill the gaps in his knowledge and achieve his goal of tackling health and inequality issues in his native Sierra Leone. This is a problem that one might not normally look to an engineer for assistance on. However, when we dig a little deeper, we see a place for engineering.