

Research and Innovation in a Changing Global Context

**Workshop Report:
Research and Innovation in a Changing Global Context,
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Introduction

Background and Audience

In March 2017, the United Kingdom's University of Leicester hosted a Workshop in Nairobi, Kenya, as a response to recent big changes experienced in the UK funding environment. The Nairobi Workshop prompted discussions of ways to enhance the contribution of research, science, technology and innovation to the delivery of the United Nation's 2030 Global Goals. Involved in the discussions were people representing the University, some of its partners in Sub-Saharan Africa, NGO and funding organisations sectors. It should be noted that there was no demand-side representation at this event including governments, civil society and the business community.

This report is intended for international funding bodies, research institutions, individual researchers, research managers, research administrators and impact partners.

Discussions at the Workshop focussed around four keys areas:

- The challenges of setting agendas in a dynamic global context
- Building long-term, sustained and equitable partnerships linking research, innovation and development
- Maximising impact and wider outcomes for all; and
- Systems working together to link research and development progress

It was noted that recent years have seen significant changes in the UK funding landscape, as well as continuing global challenges surrounding sustainable development and the role that research, science, technology and innovation (STI) can play in it.

One of the most notable changes in terms of the UK funding landscape, as a response to the United Nation's (UN) Sustainable Development Goals (SDGs), has been the creation of an Official Development Assistance (ODA)-compliant science budget to focus on grand/global challenges, under which some major funding streams have been developed. These include:

- [Global Challenges Research Fund](#): The Global Challenges Research Fund (GCRF) aims to ensure that UK research takes a leading role in addressing the problems faced by developing countries through challenge-led disciplinary and interdisciplinary research, strengthening capacity for research and innovation within both the UK and developing countries and through providing an agile response to emergencies where there is an urgent research need
- [Newton Fund](#): The UK's 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 well-being of communities. It will do so through strengthening partner country science and innovation capacity and unlocking further funding to support this work. It is part of the UK's official development assistance (ODA)
- [Ross Fund](#): a UK programme running between 2016 and 2021, which will develop, test and produce new products to help combat serious diseases in developing countries
- [Fleming Fund](#): the UK's Fleming Fund is a programme supporting low- and middle-income countries (LMICs) in tackling antimicrobial resistance (AMR). The aim of the Fleming Fund is to improve laboratory capacity and diagnosis as well as data and surveillance of AMR in LMICs through a one health approach: building capacity to collect drug resistance data; enabling the sharing of drug resistance data locally, regionally and internationally; collating

data on AMR; and encouraging the application of these data to promote the rational use of antimicrobials

- More recently, the publication of the UK's latest Industrial Strategy outlines plans for a science budget of £4.6 billion over five years which aims to build upon UK strengths and extend excellence into the future some of which will extend into activities linked to responses to 'grand challenges', the SDGs and the needs of developing countries

The UK is not alone in their investments on global challenge research with several other countries, multilateral and philanthropic organisations making significant new investments in research addressing the SDGs and other key Global Challenges. These new research funding opportunities have been designed in a way this requires new ways of working, and new relationships between researchers and potential users of research. The types of research activity being commissioned will normally require international and interdisciplinary partnerships that go beyond traditional approaches.

It was within this context that the Nairobi Workshop was organised to bring together researchers from the University of Leicester with current and potential partners from the African Continent.

Purpose of this Report

This report highlights the key messages from the discussions and presents some suggested best-practice and proposed next steps in the following four areas:

1. Agenda setting: how best to identify research questions that respond to demand and that guide research that provides transformational change for sustainable development
2. Partnerships: what good (or best) practice can be adopted by researchers, institutions and funders to create partnerships that, through being long-term, sustainable, responsive and productive, deliver research to drive transformational change for sustainable development?
3. Impact: which processes, approaches and investments are most likely to take successful research and build impact at scale?
4. The role of national innovation systems linking research and sustainable development

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Definitions

Terminology	Definition
Funding organisations	Government and non-Government agencies which provide funding to individuals and teams of researchers to work on specific types of research projects
Stakeholders	National governments, local and international research institutions, impact partners, private sector organisations, international funding organisations, , local-level government agencies, local communities, individual researchers
Development impact	The actual benefits to society arising from the outcomes of scientific research
Academic impact	The generation of knowledge and information (typically in the form of published academic content, e.g. in journal article form) arising from funded scientific research
Innovation	Researchers engaging in a process of using research to generate new ways of addressing major researchable opportunities or problems
Impact partners	Local organisations, government and non-government who are able to work in the local setting in order implement and maintain change arising from scientific research
Demand-side	Refers to individuals or institutions who are potential users or beneficiaries of research and innovation
Research priorities	High-level themes or issues that are considered important to funders, users of research or researchers themselves. Priority research areas are often aligned to activities addressing issues of greatest need or alternatively areas where most significant progress and impact is considered likely
Research questions	A research question links demand for new research and turns it into a question that can be addressed through research. The way that this is done varies between disciplines
Research agenda	Often represented as a set of agreed research priorities designed to address important challenges. Often set by governments and funders, but can also be set by research institutions and even individual researchers and research groups. Often used to inform decisions on allocating resources to support research

Risk	Refers to the uncertainty surrounding achieving development impact from a research project as well as desired longer-term goals of the project. Risk can also refer to aspects during implementation of a project, including financial, reputational and risks to staff, students and research subjects
Research community	Individual researchers, research managers, research institutions, research administrators
Enabling conditions	The setting under which impact can be maximised from research
Experimental research	Scientific research where the outcome is likely to be unclear and/or the scientific methods are untested or innovative
Blue-skies research	High-quality investigator-lead research with the primary aim of enhancing global understanding/knowledge. There need not be an immediate pathway to impact
National innovations systems	A complex environment of relationships among actors in a system, which includes enterprises, universities, research institutes and government, and the flow of technology and information among people, enterprises and institutions which is key to the innovative process on the national level

Abbreviations

Acronym	Definition
AAS	African Academy of Sciences
AMR	Antimicrobial Resistance
AU	African Union
GCRF	Global Challenges Research Fund
LMICs	Low- and Middle-Income Countries
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
SDGs	Sustainable Development Goals
STI	Science, Technology and Innovation
UK	United Kingdom
UN	United Nations

The Challenges of Setting Agendas in a Dynamic Global Context

Introduction

A [Provocation Paper](#) presented at the Workshop suggested that, there was no effective or comprehensive strategic picture of the science needed to deliver the 2030 agenda for sustainable development. It suggested that careful, and strategic consideration towards appropriate agenda-setting is now crucial.

The Workshop discussed the current dynamic global context in which science can contribute to development, as well as the high demand for tractable research with transformational potential. It was suggested that there is a role for international funding organisations and the research community in making the process in which research priorities and appropriate and tractable research questions are established, a successful one. Also suggested, was the fact that there is a clear need to develop mechanisms and/or processes which allows effective engagement with the demand-side and potential users of research.

Key Issues

Successful agenda-setting depends upon an inclusive approach which includes all relevant actors and stakeholders in establishing research priorities and defining research questions. International funding organisations and the international research community must ensure that they have, through the involvement of key local stakeholders, a clear understanding of local problems which require research investments. They should avoid having an approach that is overly influenced by their own motivations and research interests. The input of relevant stakeholders, including the demand-side and users of research, who can work together to establish tractable research questions, which speak to national research agendas, is critical for successful agenda-setting.

A mechanism or process is needed whereby relevant parties (including, for example, funding organisations and prospective partnering research organisations) can be convened in order to work together to establish research questions. Strategic opportunities need to be created outside of the usual cycle of responding to a specific funding call, without pressures of budgetary constraints, and with sufficient time, to hold meaningful and progressive discussions. To be most beneficial, this has to happen before international (and often national) funders have shaped the nature of what they are going to be commissioning through a funding round and there must be transparency in the discussions around the true objectives of the funders.

In the developing country context, as is the case in Kenya where the Workshop was hosted, for example, research is currently, largely, externally funded. This is changing as national funding agencies are established and start to commission research delivering against agreed national priorities (e.g. [Kenya Vision 2030](#) and Rwanda's current process to develop their [Vision 2050](#)). International funders need to work with developing country nations and stakeholders to best understand how to achieve synergies across what they as funders are able to commission, and what African countries want to achieve from research investments. International funding organisations and research institutions need to work together to share information around local problems. Careful consideration is required in terms of priorities in the local setting, which problems require research and at what scale.

Identifying synergies across research portfolios is important in considering what efforts are already contributing to national, regional and global research agendas through appropriate research priorities and questions. Funding organisations and researchers should make themselves aware of existing research agendas and consider their appropriateness – it may be the case that there are already research questions that are relevant and there may not always be the need for new research questions to be developed.

The extent to which current research agendas can be turned into tractable research questions should be considered. The use of pre-existing information from previous and/or ongoing research investments, including knowledge of what's already currently being funded and researched, as well as the findings, will bring about the avoidance of unnecessary duplication of work and investment, will identify tractable research gaps with transformational potential, synergies across investments, and will, ultimately, contribute to more detailed and precise research agendas.

In setting research agendas, there needs to be some level of acceptance that research might produce unexpected results and/or outcomes that are uncertain. There needs to be careful consideration of, and planning for, how to inform policy with uncertainty.

In the African context, i.e. throughout the African Union (AU), there is growing commitment of national governments in supporting the science agenda. In order to positively influence national science agendas, and to best address global challenges, more opportunities are needed for developing country researchers to conduct world class research that can change lives in their own nations and globally.

Some progress has been made in a number of countries. One example given described recent progress in Kenya towards more effective routes for research and innovation to addressing national and regional development challenges. Kenya has committed 1% of GDP to science spending, for example, and is involved in international initiatives such as the Newton Fund. There has already been a shift towards increased involvement of the private sector and other kinds of stakeholders such as NGOs, the African Academy of Sciences (AAS) and the New Partnership for Africa's Development (NEPAD), for example.

To best address global challenges, funders are encouraged to support blue skies-type research in order to enhance the potential for transformation. Experimental research should be encouraged which might produce unexpected results and impacts. Funding organisations should look to increase levels of incentivising experimental research questions. In doing this, they need be open to learning from good practice and from other institutions.

Best-Practice Matrix for Successful Development Research

1. For donor organisations: ensure that there is a requirement for and a mechanism by which funders include relevant stakeholders (for example, national governments, local research institutions, other international donor organisations, UK research institutions, local communities) in establishing required and appropriate research priorities which speak to national-level science agendas
2. For researchers and donor organisations: seek a clear and real understanding of local problems that require research investments (avoid making assumptions based solely on own motivations and research interests)

3. For donor organisations: allow resource (time and finance) to convene joint-working with national-level organisations in developing country nations ahead of shaping a funding call, in order to best marry up what the real problems are with the criteria for the funding call
4. For researchers: ensure inclusive agenda-setting and co-creation of research questions by way of involving all relevant partners in the project development process from the outset
5. For donor organisations: examine pre-existing information and knowledge in order to inform future research investments – seek synergies across investments and be open to learning from other institutions
6. For donor organisations: ensure that local institutions have capacity to be responsive, through previous investments, to unexpected global crisis (e.g. Ebola outbreaks)
7. For donor organisations and research institutions: in order to positively influence national science agendas, and to best address global challenges, create opportunities for developing country researchers to conduct world class research that can change lives in their own nations and globally
8. For donor organisations: seek to take a more innovative approach by way of taking risk in the types of research that is funded. Encourage more openness within donor organisations to blue skies-type research and in incentivising risk-taking through research questions

Building Long-Term, Sustained and Equitable Relationships

Introduction

Effective and equitable partnerships are required in order that research can be implemented successfully in addressing development challenges. Equitable and sustainable partnerships are crucial in generating knowledge that can lead to development and academic impact, and where all partners can benefit from being part of a research partnership. Workshop participants were asked to consider what a good partnership would be, using the guidelines provided as eleven principles and seven questions (<https://11principles.org/>) developed through the Swiss Academy of Natural Science.

Traditional approaches to designing, commissioning, implementing and applying research for development have led to relationships that are not as effective and/or equitable as they need to be. Workshop participants felt that significant improvements can be made to build more effective and equitable partnerships for future research investments that will enhance the potential for transformative impact at scale.

This section outlines some areas where more can be done in ensuring research partnerships are as effective, sustainable and successful as possible.

Key Issues

Across development science, there is a need to seek equitable partnerships in an unequal world. A research partnership needs to recognise, and work with, the inherent differences between developing and developed country contexts, for example in aspects such as physical, human, infrastructural and financial resources available to researchers. While it was recognised that individual projects cannot address these differences, it was felt that projects could be designed to minimise their impact. Projects were seen to have a role in building future human capacity through involvement in the research process.

The discussion of the role of overheads led to a strong statement of the need to redress inequitable conditions currently governing the split of overheads between northern and southern institutions. It was stated that at the time of the Workshop, developing country institutions are subject to lower overhead ceilings (often as low as 15%) than lead, developing country partner institutions.

Funding organisations' rules, which dictate conditions of funding calls, and which may act as a barrier in achieving equality between partners from the north and the south, need to be clearly understood as do the reasons for their existence and how they may need to change in order to promote more equal partnership agreements. The example given by African participants was their ineligibility to act as Principle Investigator on many of the new family of UK ODA research funds.

International research teams need to work collaboratively across all areas of project design and management. Joint-working in setting the research question, agreeing the partners to be involved in the research team, and in setting the way in which the research project will operate was seen to be crucial for a successful research partnership. The Swiss Guidelines on the conduct of transnational research were seen to provide a useful starting point for establishing good practice.

New approaches need to be explored to achieve more significant results through the activities of effective partnerships. This could be achieved through investing in the development or extension of existing partnerships to make them more fit-for-purpose, or in some cases through establishing new partnerships. It was felt that the nature of the partnerships needs to change to become longer-term strategic relationships, built on complementary strengths, shared objectives, trust and respect.

Funding organisations should continue to consider when it is appropriate to include opportunities for (new) partnerships to develop to be able to meet the needs of future research calls. It was recognised that this does happen in some cases, and it was suggested that all funding organisations and researchers might benefit from international lesson learning in this area.

Research institutions could contribute by taking a more strategic approach to future staff and institutional development to address large research initiatives such as global challenge research. This would cover all areas of activity including the support and incentives/reward systems given to research staff at all stages of their careers, the way that strategic staff appointments are made as well as investments in infrastructure, systems and processes. It was also recognised that there was a key role for strategic partnerships or relationships between institutions that go beyond a focus on a few joint projects.

In the research community, there is demand for continual capacity strengthening and, in particular capacity building for the future – for example, investing in studentships, PhDs and professorships, as well as student exchange programmes. It was accepted that there is an ongoing need for capacity strengthening, but some questioning of the best ways to do this. It was accepted that in some cases it will help to build components into the design of funding calls as an incentive to bring about investment in this area by research institutions and teams. It was noted that some aspects of future capacity building, PhD studentships, for example, were excluded from some current UK funding schemes and there was discussion if a way could be found to address this significant gap.

Research teams need to be mindful of the benefits of involving and including actors from out-with the traditional research project – not just universities but private sector organisations, for example, who may well have an important part to play in both setting the research agenda at the start of the process and then assisting the process to adapt and implement research findings following the formal end of the project.

In all partnerships, there is a need to understand each other and each other's motivations. Clearly understood shared vocabularies, a shared understanding of the funding environment as well as each other's disciplines must be developed. Carefully considered language needs to be used when speaking with partners from outside the traditional academic area.

More needs to be done to ensure that trust lies at the heart of successful partnerships. This applies to funding organisations trusting the partners who are implementing their funded-projects as well as between research institutions.

At the time of the event in Nairobi, partnering was often initiated by individuals, in response to a specific funding call. This reactionary approach can lead to an ad hoc approach to the choice and suitability of partners. Developing country research institutions often find that they are approached in a very last minute manner, as part of the closing stages of a project's proposal development, with a request to partner.

It was suggested that developing partnerships for the long-term, with a clear motivation of building a joint evidence base in a specific area, and not just for one distinct project (in response to one specific funding call), would be a more effective approach to establishing strategic, sustainable and proactive partnerships. This would then enable pre-established, international research teams to respond jointly to funding calls as and when they came out, in a more proactive, and less reactive, manner.

It was recognised that funding organisations and research institutions have roles to play promoting equity and diversity agenda in both research teams and the outcomes of research. It was recognised that ensuring gender parity as part of equitable partnerships, but recognised that new research must also consider other protected characters. Equity and Diversity should to be a consideration from the outset – as part of setting research questions, for example. Achieving equity and diversity can be achieved by challenging and changing the view of what a traditional scientist looks like among non-science groups, including in schools, for example, thereby embedding the notion of gender parity from a very early stage within society. Research institutions should allow researchers the space to contribute to this.

Participants from the African Continent stated that their perception is that there is currently more support to develop North-South partnerships (or North-South-South partnerships) than there is for relationships lead from a South-South perspective. A number of potential reasons where discussed which included lack of financial resources required to build partnerships, lack of potential initiatives to help partnerships form (e.g. calls for international South-South projects) and restrictions on travel (e.g. visa requirements) which may be more restrictive for movement between some African countries than between the UK/Europe and the same countries.

Best-Practice Checklist for Successful and Effective Partnerships

1. For donor organisations: identify own internal rules and systems which may currently prevent equality between partners from the north and the south (for example, rules governing the split of overheads between northern and southern institutions), work to gain a clear understanding of what these rules are, why they exist and to change these to promote more equal partnerships
2. For funders and research teams: ensure a focus on gaining a firm understanding of the cultural context in-country, the way in which wider society operates as well as how the cultural ecosystem and environment interact

3. For research teams: ensure collaborative working in agreeing all areas of project management from the outset (i.e. in setting the research question jointly, in agreeing partners to be involved in the research team jointly, and in agreeing the details of operationalising the research project)
4. For donor organisations: in forming effective partnerships, seek to provide financial resource and to allow sufficient time for prospective research partners to convene and to form meaningful and mutually beneficial partnerships through which they can respond to research calls in the future
5. For research institutions: build enabling environments for researchers where, among other things, there is a balance between institutional and individual activities such that individuals and institutions can benefit equally from being part of research partnerships
6. For funders: where possible, aim to build-in requirements for capacity strengthening, with a focus on developing country research institutions, into the conditions of research calls, such as having a requirement to invest in studentships, PhDs and professorships through research projects, as well as student exchange programmes
7. For research institutions: support capacity strengthening opportunities made available via funding calls. Through cross-institutional agreements, develop student and staff exchange programmes outside of specific funding calls. Set aside budgets to stimulate early career researchers
8. For researchers: be mindful of the benefits of involving and including actors from out-with the traditional research project
9. For funders: ensure that call criteria allow for the inclusion of non-traditional actors as partners
10. For research teams: develop clearly understood shared vocabularies, a shared understanding of the funding environment in which you're operating, as well as each other's disciplines
11. For research institutions: develop partnerships not just for one distinct project, in response to a specific funding call, but with a view to it being a long-term strategic partnership
12. For donor organisations and research institutions: both play an active role in ensuring gender parity as part of equitable partnerships
13. More needs to be done to ensure that trust lies at the heart of successful partnerships. This applies to donor agencies trusting the partners who are implementing their funded-projects as well as between research institutions.

Maximising Impact and Wider Outcomes for All

Introduction

Most major research funding organisations currently expect research teams to show, through their project proposals, how investment in their research proposal will lead to a range of benefits to society (development impacts) as well as academic outcomes (academic impacts).

Participants felt that there are challenges in this. For example, they felt that some funders of development research are failing to articulate their expectations for impact and the degree to which individual projects are expected to achieve impact during their lifetime (as opposed to following their formal close). The way that funders' expectations are articulated varies significantly, as do the types of desired outcomes that are considered to be impacts. Generally, research institutions are

expected to demonstrate evidence-based impact as a result of their research and to present their plans for impact as part of their project proposals. However, at this time, many researchers do not yet understand the contribution that they need to make to build impact and how they need to work with others to deliver sustainable impact at scale.

The key considerations outlined in this section highlight what can be done by funders and research institutions to create an environment in which research can drive real and sustainable development impact.

Key Issues

It was suggested that funding organisations should ensure clarity in their expectations surrounding impact when releasing call documents and ensure that there is a definitive explanation of how the term 'impact' is being interpreted. Currently, there is a lack of clarity within the research community in relation to what the term 'impact' means.

In conceiving a funding call, funding organisations should consider whether it's more appropriate to build impact into the core of a project's activities, as part of the condition of funding, or whether it would be more beneficial to consider having a separate funding stream solely to maximise impact following the formal close of the research project, should the potential be identified. This would require separate investment specifically for impact.

Funding organisations could look at their research portfolio and identify those projects that demonstrate the potential to achieve impact and could put them forward for following on impact funding.

Not all projects will achieve impact so a one-size-fits-all approach isn't likely to be optimal. Funders need mechanisms to accelerate impact where it's likely. A number of UK funding bodies now provide follow on funding specifically for impact activities.

Funding organisations could look to invest in synthesis work designed to look for synergies across their research portfolios, grouping projects into complementary groups or clusters where investment in impact activities could be beneficial, as well as outlining the best next steps in maximising impact. There would need to be a clear mechanism by which to fund these next steps, however.

Local input, from the people on the ground, whose lives will be changed, is critical in achieving impact. Local community members should be involved from the design phase of a project (thereby gaining their buy-in of the research endeavour) and then in the implementation phase where they will be on the ground, using the results of the research. Appropriate partnerships are required (as is outlined in the previous section), including implementation partners, who will have an important role to play in maximising impact, once a research team has retreated from the community, working alongside local communities.

Informing decision-makers in the local country context, using a robust evidence base, must be a key motivation of any research endeavour.

Research teams need to identify the best ways in which to link their research with national political, social and economic agendas and priorities. This requires having deep and successful local partners in-country.

It's not always possible to predict impacts from research however it is possible to plan to create the opportunities for future impact. Research teams should therefore, at the very least, use a method to conceptualise potential impact pathways (through a Theory of Change, for example) as part of their project development while also being prepared to act rapidly and with flexibility if new demand or opportunities become apparent.

Best-Practice Checklist for Maximising Impact

1. For donor organisations: ensure clarity in expectations surrounding impact and that there is a definitive explanation of how the term 'impact' is being interpreted in any particular funding call
2. For donor organisations: consider how best to resource impact activities – e.g. by building impact into the core of a project or under a separate funding stream, solely to maximise impact following the formal close of a research project
3. For donor organisations: look at research portfolio and identify projects that demonstrate the real potential to achieve impact and consider then how best to resource follow-on impact-related activities
4. For donor organisations: ensure that there is a mechanism to accelerate impact where it's likely that it would provide societal benefits – e.g. invest in synthesis activities designed to look for synergies across a research portfolio, grouping projects into complementary groups or clusters, where investment in impact activities would be valuable
5. For research teams: in order to maximise impact from research, drive towards the connectivity of the generation and validation of knowledge with delivering a product or a service from the science
6. For donor organisations and research institutions: change needs to be incentivised at all levels (individual and societal levels) by way of recognising and targeting different, relevant stakeholders (including implementing partners) and different desired impacts
7. For research teams: link research and outcomes/outputs with national agendas and priorities in order to inform decision-makers in the local country context through a robust evidence-base
8. For research teams: impact can't be guaranteed from all research however research teams should, at the very least, use a method to conceptualise impact pathways (through a Theory of Change, for example) as part of their project development phase

Systems Working Together to Link Research and Development Progress

Introduction

Discussions in Nairobi highlighted the importance of both innovation and knowledge systems to build impact from development science addressing global challenges. In addressing global challenges, there has been a shift towards thinking about systems in terms of a chain of actors that we want to encourage to work together. Effective institutions (with effective infrastructure and staffing) is key. This requires social capital investments, policies, good governance and investment through STI funding. There also needs to be a focus to the direction of the system and the rate of innovation that we want to see within it. National innovation systems need to be directed at social challenges and impacts.

Key Issues

Researchers are encouraged to think about, and gain an understanding of, how their research fits into the wider innovation system and how it can potentially contribute to a process of change. Many participants were unfamiliar with the terminology and concepts used in this section of the Workshop, suggesting the need for a review and guide to the role of innovation systems in linking research with development impact.

Capacity building on various levels is required, particularly in developing country nations, but also across developed country institutions. It is important to invest in non-core research activities such as understanding national systems and building strategic partnerships, but it was also recognised that this is not something that all researchers should do.

There is a need to create opportunities for developing country researchers at all levels to conduct world class research that can change lives. A successful national innovation system will contribute to this. In developed country institutions, channels are needed which will help early- and mid-career researchers engage in the process of using research to generate new ways of addressing major researchable opportunities or problems (i.e. to innovate).

In order to fully appreciate the national innovation system, institutional private and public sector interactions are crucial. These partnerships are also crucial in operating within a national innovation system. The private sector, for example, will exploit the science/knowledge from the public sector and will constitute a good implementing partner in the local/regional setting.

In the African context, national systems of innovation recognise that a greater range of actors (other than those typically involved at this time in research projects) is needed when seeking to develop impact. Indeed, national systems of innovation in Africa tend to move away from the view that research and development is done in the public sector only and recognises that it's important to engage private sector organisations, for example. That said, at the national and local government level, traditional policy-making processes do tend to take their evidence from universities (i.e. the public sector), and not from private sector organisations.

Underpinning all science-for-development must be an open-science approach where access to knowledge and data-sharing is equitable. Data and knowledge is, after all, a precious resource and is at the heart of the research, science, technology and innovations which will contribute to development progress globally.

Progress will be stronger once developing country institutions are skilled up in best leveraging international funding support, along with their own national resources, in order to make their own Government's financial contributions to science go further.

Best-Practice Checklist for Effective Innovations Systems Supporting Research and Sustainable Development

1. For researchers: in developing a research proposal, researchers should focus on gaining a clear understanding of how the research fits into the wider innovation system in the local country and how it can potentially contribute to a process of change

2. Research institutions: allow people the time to invest in non-core research activities such as understanding national systems and building strategic partnerships. Support early- and mid-career researchers to engage in the bigger picture
3. For research institutions: work to build strategic, sustainable and effective institutional and private sector partnerships are crucial. These partnerships are also crucial in operating within a national innovation system
4. For national government bodies: develop enabling conditions (a combination of financial and human resource as well as effective governance) using government policies to feed the national innovation system
5. For research institutions: make and maintain links within the knowledge system by way of utilising the role of knowledge intermediaries
6. For donor organisations and research institutions: ensure an environment where an open-science approach is the norm, providing access to knowledge and data-sharing in an equitable manner

Outcomes from the Workshop

The main outcomes of the workshop are summarised below:

- The participants discussed a wide range of concepts for research activities, some of which progressed to become applications and some have resulted in funded projects. These activities continue to be developed and the outcomes recorded.
- Five of the Universities that attended the workshop signed a letter of intent to work more closely together. This in turn led to a proposal for the 'Nairobi Alliance' which currently links the Universities of Nairobi, Rwanda, Malawi, Witwatersrand and Leicester. Work is ongoing to further develop the Alliance and link this growing research partnership with potential collaboration for educational activities.
- The discussion about the role of innovation and innovations systems that commenced at the Nairobi workshop have since been taken up in other contexts. Interest from OECD has continued and the themes outlined in Nairobi have been taken up in other OECD contexts. This was also shared by Leicester staff during events in Colombia and Egypt, with both countries exploring options for follow-up activities considering the role of innovation in addressing global challenges. In all of these countries and regions the opportunity and need for innovation to create productive new jobs has been highlighted as a national priority. The University of Leicester is currently planning a follow-up workshop to be held in Colombia in December 2018.
- The University of Leicester has started to apply the lessons learnt from the Nairobi event. Many of the points outlined in this report, featured in the University's approach to develop a long-term strategy to support its research to address the needs of developing countries to address shared global challenges. The University of Leicester has also recently established the Leicester Institute of Advanced studies (LIAS) to promote the development of interdisciplinary research¹. LIAS will provide significantly enhanced support for collaborative research design to address shared global challenges. The Institute's first Director, Dr Lisa Smith, was one of the Leicester team that contributed to the Nairobi workshop and subsequent follow-up activities.

¹ The Leicester Institute for Advanced Studies (LIAS) is an interdisciplinary centre of excellence, dedicated to creating a collaborative and inspiring environment. It brings together researchers from across all disciplines to deliver ambitious, transformative and impactful research. The Institute is intended to help break down the silos that have traditionally been a feature of higher education research. It represents a step change in our approach, allowing academics to be even more innovative and to bid for more ambitious research funding in the future.

The institute brings together researchers from across all disciplines to deliver ambitious, transformative research that makes a difference to the wider world. This is achieved by funding interdisciplinary teams to extend the boundaries of human knowledge. The institute brings outstanding academics from around the world to the University of Leicester for research collaboration and to enrich our environment. LIAS offers academics a stimulating and provocative events programme that showcases excellent scholarship and liberates debates.

Annexes/Supporting Information

- Nairobi Provocation Paper – download the paper [here](#)