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Partner Country Case Study: Kenya

Final Evaluation of The Newton Fund

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Abbreviations

AH	Award Holder
ARMs	African Resource and Environment Management Satellite
BBRSC	Biotechnology and Biological Sciences Research Council
BEIS	Department for Business, Energy and Industrial Strategy
BRI	Belt and Road Initiative
CDC	Centres for Disease Control and Prevention
CUE	Commission for University Education
CV	Curriculum Vitae
DAAD	Deutscher Akademischer Austauschdienst
DeKUT	Dedan Kimathi University of Technology
DFID	Department for International Development
DP	Delivery Partner
ECR	Early career researchers
ESCAPE	Oesophageal Squamous Cell Carcinoma African Prevention Effort
ESRC	Economic and Social Research Council
EU	European Union
FCDO	Foreign, Commonwealth and Development Office
FDI	Foreign direct investment
FP7	Seventh Framework Programme
GBP	Great Britain Pound (pound sterling)
GCRF	Global Challenges Research Fund
GDP	Gross Domestic Product
GERD	Gross domestic expenditure on research and development
HAP	Household air pollution
IARC	International Agency for Research on Cancer
ICT	In-country team
ICT	Information and communications technology

ILV	Indigenous leafy vegetables
IP	Intellectual Property
ISEE	International Society for Environmental Epidemiology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JSPS	Japan Society for the Promotion of Science
KENIA	Kenya National Innovation Agency
KES	Kenyan Shilling
KPI	Key Performance Indicator
LIF	Leaders in Innovation Fellowships
LMI	Lower-middle-income
LMIC	Low-to-Middle-Income Country
MEL	Monitoring, evaluation and learning
MOHEST	Ministry of Higher Education, Science and Technology
MRC	Medical Research Council
MSMEs	Micro, small and medium enterprises
MTP	Medium-Term Plan
NASCOSTI	National Commission for Science Technology and Innovation
NCD	Non-Communicable Disease
NCST	National Council for Science and Technology
NERC	Natural Environment Research Council
NIHR	National Institute for Health Research
NRF	National Research Fund
OAAAs	Operational Activity Agreements
ODA	Official Development Assistance
PASET	Partnership for Skills in Applied Sciences, Engineering and Technology
PF	Prosperity Fund
PI	Principal Investigator
R&I	Research and innovation
RTI	Research Triangle International

SDG	Sustainable Development Goals
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
TAHEST	Taskforce on alignment of Higher Education, Science and Technology
TTO	Technology Transfer Offices
UKRI	UK Research & Innovation
USD	United States Dollar
WHO	World Health Organization

Executive Summary

The Newton-Utafiti Fund¹ in Kenya at a glance

- The Newton-Utafiti Fund was launched in 2016 with the UK contributing £4.5 million over the period 2016/17 to 2020/21.
- The Fund supported joint UK – Kenya research projects, focusing on three out of the four priorities for the Kenyan government’s Big Four agenda: affordable healthcare for all, food security and manufacturing.
- The Newton-Utafiti Fund was widely perceived by interviewees as a valuable and mutually beneficial funding partnership, supporting useful, relevant research that might not have received funding from other sources. It has also helped to build the capacity of researchers and entrepreneurs and developed links between UK and Kenyan academic institutions.
- The Fund was launched at an opportune moment, given Kenya’s push at the same time to promote science and technology-based development. It is also considered a useful tool for furthering science and innovation collaboration, laying the groundwork for high-level Kenya-UK science and research initiatives.

The case study

Tetra Tech International Development produced this Kenya Partner Country Case Study to inform the Final Evaluation Report of the Newton Fund. It is one of 11 country case studies investigating the Fund’s implementation and results. It serves as a deep dive into the development, relevance, additionality, and results of (a) the programme activities; and (b) their success factors and barriers that affected their implementation.

The case study sampled three calls under the Newton Utafiti Fund, and from each a project was selected for in-depth analysis:

- **National Research Fund Research Links workshop: strengthening indigenous leafy vegetables research and innovation capacity.** This workshop, held in Kenya in September 2018, aimed to support research on the role of indigenous leafy vegetables in mitigating nutrition deficiencies and strengthening food security in the country. It aimed to build researchers’ capacities and develop research partnerships. The workshop was valued highly by participants and some further research partnerships in this field have already been launched as a result.
- **Kenya Joint Partnership on Non-Communicable Diseases: Household air pollution and risk of oesophageal cancer: a case-control study in Western Kenya.** This partnership between Moi University and Liverpool University aims to build on previous research on the relationship between household air pollution from biomass cooking stoves and oesophageal cancer in Kenya. Although currently on hold due to COVID-19, the research is expected to resume soon. Findings from the research will be relevant to Kenya and other countries where solid-fuel cooking stoves are widely used as well as for wider research and policy on air pollution, health and clean energy.

- **Kenya Leaders in Innovation Fellowships (LIF) Programme.** LIF is a leadership development programme for entrepreneurs from Newton Fund countries which supports the commercialisation of innovations that address social and economic challenges. LIF participants attend a two-week residential workshop in the UK and then receive follow-up coaching and support. Fellows and Delivery Partners (DP) valued LIF greatly. Kenyan innovators felt it gave them valuable business skills and also that product development would not have advanced so far without the training. There is good evidence the programme will meet its objectives. Notably, several projects have now been launched with the support of private investment.

Research for this case study included reviewing documents at project- and Fund-level and carrying out interviews. 26 respondents were interviewed from both the UK and Kenyan side of each partnership, including DP's, Award holders (AHs) and UK embassy staff, as well as high-level stakeholders from partner organisations in Kenya.

The case study is a self-contained investigation and its findings are not intended to be generalised to the entire Newton Fund in Kenya. Case studies were undertaken remotely due to the pandemic and limited to reviewing three projects. In some projects, undertaking the research remotely limited the number and range of stakeholders who could be consulted. Findings reflect the data provided by each project and information available from public sources online. The volume of documentation provided varied by project, thus limiting the possibility of triangulating findings. The projects selected represent a very small fraction of all expenditure across the 5,400 Newton Fund projects. While it provides a valuable illustration of Newton Fund activities, the case study is not therefore representative of the Fund's work as a whole.

Key Findings

Effectiveness

- **The Newton-Utafiti Fund has helped fund research relevant to Kenya's priorities, build the capacity of Kenyan entrepreneurs and researchers, and promote research links between institutions.** All three projects reviewed in this case study had either met or were on track to meet their objectives and were viewed positively by researchers, study participants and DPs in both Kenya and the UK. Despite initial teething problems due to capacity constraints on the part of Kenyan DPs and difficulties with match funding, the Newton-Utafiti Fund is seen by participants as a well-run programme.
- **Having an in-country team (ICT) administer the programme from the British embassy provided strong benefits.** This meant the ICT could track implementation locally, develop in-person relationships with participants, and support Kenyan Delivery Partners and project teams. It also provided benefits for the Kenya-UK relationship which other funds managed from the UK (such as the Global Challenges Research Fund – GCRF) might not achieve. The collaborative nature of the partnership also provided soft power benefits for the UK, promoting the UK's role as a trusted science partner in Kenya.
- **The equitable nature of the Newton-Utafiti Fund, involving both joint priority-setting and match funding, was also emphasised as a key strength.** In particular, it enabled to align the Fund closely with Kenyan government priorities and ensured commitment by both sides.

Emerging impacts

- **Although it is too early to see the programme's full impact, stakeholders expect the three projects to produce positive outcomes for Kenya.** For instance, one of the projects reviewed for this case study has already led to a subsequent collaboration between Kenyan and UK researchers. However, some challenges remain to securing longer-term impact, which may limit the potential for further Kenyan-UK research collaboration. These include difficulties in accessing funding for proposed collaborations and challenges for Kenyan researchers in accessing international research and exchange opportunities (including obtaining visas).

Sustainability

- **All three projects-built sustainability considerations into their design, including plans for academic publications and the commercialisation of innovations.** While there are ambitions for longer-term collaborations and Kenya-UK links among beneficiaries, the extent to which these are achieved in practice will depend in part on external factors such as the availability of follow-up funding from other sources.
- **Respondents felt that Kenyan-UK government relationships developed through administration of the Newton-Utafiti Fund would outlast the Fund itself.** However, the fact that interviewees strongly emphasised the value of the partnership approach raises questions as to whether relationships will be sustained in practice without jointly funded projects which focus on local priorities. In addition, the ability to translate soft power into long-term benefits will depend on the UK sustaining its support for science activities compared to other donor countries.

Complementarity and Coordination

- **Some respondents felt the Fund could have focused more on strengthening Kenyan institutions' capacities and tackling wider barriers to Research and Innovation (R&I).** The three projects focused on early-stage research or innovations, of which two have clear plans to use their findings to inform policy. The Fund has also provided benefits for Kenyan institutions, including exchange programmes for Kenyan Delivery Partner staff. However, respondents felt that capacity to help translate research into policy or other products and services would be a better focus.

Lessons Learned

- **UK DPs found it difficult to administer the match funding during the early stages of the Fund and would have benefited from more detailed guidance.** Match funding was appreciated by participants as demonstrating the joint commitment of both sides to objectives. However, there was some confusion among UK DP's about expectations for match funding, with some expecting pound-for-pound contributions from Kenyan institutions (which was not always feasible). In addition, it was sometimes difficult to align budgets, financial years and disbursements across DPs.
- Few significant challenges were reported during collaboration. Those that were mentioned included **capacity constraints for Kenyan DPs in general, and the fact that DPs on both sides were in the process of rolling out their own operations at the same time that the Fund was being introduced.** As a result, additional staff and support from the ICT was required during the transition phase, and the expansion of activities was delayed. Kenyan DPs also found it more complicated and time-consuming than expected to obtain the

Operational Activity Agreements (OAAs) from Kenyan authorities needed to start work in Kenya.

- **Coordination and communication among UK DPs posed challenges at times.** The novelty of the Fund was a contributing factor, in particular because BEIS was not used to operating devolved and partnership delivery models with an embassy. However, this improved over time. For example, while some early LIF participants were unable to travel to the UK because visas were refused or not issued in time, changes to the process resolved this problem for later cohorts.
- **The Fund has created opportunities for synergies within the wider region in research and innovation collaboration.** Kenya drew useful lessons from South Africa's Newton Fund experience when it joined the programme and set up the Newton-Utafiti Fund. The two countries have a science cooperation agreement, and South Africa often influences Kenyan R&I activity. Similarly, there is potential for Kenyan R&I activity to have spill-over effects in neighbouring countries.
- **Academic and research institutions' participation in the LIF programme has been limited among Kenyan cohorts than in other LIF countries.** While this may reflect the priorities of KENIA as an institution, as well as the wider Kenyan innovation ecosystem, it may also reduce opportunities for wider Newton Fund objectives, such as institutional strengthening and developing links between academia and industry. The programme could consider ways to strengthen links to universities and Technology Transfer Offices and more generally in Kenya.

Considerations and recommendations for the Newton-Utafiti Fund

- **The Kenyan government's contribution was sometimes underappreciated by UK stakeholders.** The Fund could consider reviewing promotional and application materials and attribution guidance produced by Delivery Partners to ensure the contribution from the Kenyan government is clear to applicants and beneficiaries.
- **The Fund should ensure operational processes effectively align with administrative processes on the Kenyan side.** It should also effectively communicate the implications to all parties during project planning (for example, with regard to timelines and funding schedules, or the need for OAAs).
- **The Fund could consider further opportunities to take advantage of regional synergies between South Africa and Kenya.** This could include promoting trilateral research collaborations (such as those undertaken in the Institutional Links programme), strengthening regional research networks and developing solutions to regional challenges.
- **The Fund could consider other ways to support institutional capacity-building within Kenya.** The Fund's support for projects is widely considered likely to produce positive impacts. However, interviewees said that benefits were primarily for individuals rather than institutions, and that more could be done to strengthen the capacities of Kenyan institutions.
- **Sustainability would also be promoted by further linking Newton-Utafiti activities to other opportunities** for funding, collaboration or other support (such as GCRF, British Council programming or the UK High Commission's communications capabilities).

- **The Fund should consider building social impact monitoring into the design and implementation of activities.** This would allow the Fund to identify and monitor potential barriers to impact at project level. It would also help it monitor long-term impact (including contribution to Kenya’s socio-economic goals) and showcase the benefits of project activities to partners in the UK and Kenya.

1 Introduction

1.1 Aim and purpose of the case study

This report presents our findings for our country case study of Newton Fund activities under the Newton – Utafiti Fund in Kenya. While these findings will inform the Newton Fund’s final evaluation, they are specific to the country under investigation and not to be generalised to the broader Fund. The strength of evidence (see Section 1.5) for this case study should guide the reading of the results set out in Sections 3- 6. Remote research was carried out in **September – October 2020**.

The purpose of the case study is to examine:

- the relevance of the country-level work to the Newton Fund’s theory of change, including the ways in which funded projects have supported the Newton Fund to achieve its stated outputs and outcomes.
- the effects of Newton funding in terms of the scale and type of results delivered by the sampled projects, and their potential impact on the socio-economic challenges identified in the country and more widely.
- the likely sustainability of the activities and results of the sampled projects and by the Newton Fund.

We also aim to better understand the overarching significance and impact of the Newton – Utafiti Fund in Kenya, such as on the internationalisation of research institutions, the relationship between the partner country and the UK, and the sharing of best practice between the two countries.

1.2 Research scope

This country case study focussed on the activities under the Newton – Utafiti Fund. It assessed:

- the **development of each activity** – examining its origins, how engagement with the Newton Fund occurred, and an overview of the process of securing Newton funding.
- the **relevance of each activity** to Kenya’s development needs and to Newton Fund and Official Development Assistance (ODA) goals.
- the **additionality of each activity**¹.
- the **results of each activity** in terms of the outputs, outcomes and impacts generated to strengthen the science and knowledge base, innovation capacity and policy influence in Kenya and beyond.
- the **success factors (and barriers) which affected each activity**, as well as the potential benefits from each activity that might be expected to arise in the future.

¹ In the context of the Newton Fund, additionality aims to assess whether a given call or project could have happened in the absence of the Newton Fund (for example, through funding for similar activities provided by other programmes).

The case study included a mix of ongoing and completed activities. When assessing results, we considered their ambitions as well as early signs of impact, while recognising that these take time to emerge.

To understand how sustainable solutions to economic development and poverty reduction have emerged from Newton Fund activities, our enquiry focussed on the factors that facilitate research activities, increase the quality of research outputs, enhance international collaboration for higher-level education and translate research into innovative practices.

1.3 Case study selection

As part of our sampling methodology for the Newton Fund country case studies, we shortlisted case study calls for each country based on three measures: size, pillar, and sector (see Annex 2 for details). Project selection considered thematic areas of focus, aiming to include priority areas for the Newton Fund in each country. We also sought to achieve a spread of Delivery Partners (DPs) and activity types across the countries in our sample. Following consultations with in-country teams (ICTs), DPs and the Newton Fund Central Team, we selected **three calls per country**. This selection allowed us to include a call under each of the Newton Fund’s core activity pillars: People, Research, and Translation.

The next step to the case study selection is the sampling of one specific project from each of these three calls to ensure broad geographical and partner coverage within the country case study's short timeframe. We also considered the relevance of their specific research areas to the Newton Fund’s priorities in Kenya when the projects were selected.

In Kenya, the sampled calls and projects analysed in depth in this report are:

Funding Call	Projects
Researcher Links	Improving food security and nutrition in Kenya: strengthening indigenous leafy vegetables research and innovation capacity
UK-Kenya Joint Partnership on Non-Communicable Diseases	Household air pollution and the risk of oesophageal cancer: a case-control study in Western Kenya
Leaders in Innovation Fellowships programme	Leaders in Innovation (LIF) Programme 4

1.4 Methodology

The research for the country case studies included desk-based review documentation and remote key informant interviews (see Annex 1). For the Kenya case study, we consulted 26 UK and Kenyan stakeholders such as Delivery Partners in both countries, award holders (AHs), senior staff from partner organisations as well as the programme team and UK Embassy staff.

Due to COVID-19-related travel restrictions, we had to switch to a purely remote approach. We assured the quality of our interviews by building rapport with stakeholders by email prior to the interviews, reviewing documents thoroughly to identify the most important gaps to keep the sessions brief amongst other steps. Details of the limitations of this approach and our mitigation actions are set out further in Annex 1.

1.5 Strength of evidence assessment

Tetra Tech used a traffic light system to assess the case study’s strength of evidence (see figure 1 below).² The rating assesses the evidence supporting the conclusions reached given the methodological limitations outlined in Annex 1. Table 1 details the main sources of evidence used for this case study and the rating assigned to it.

Figure 1: Strength of evidence ratings

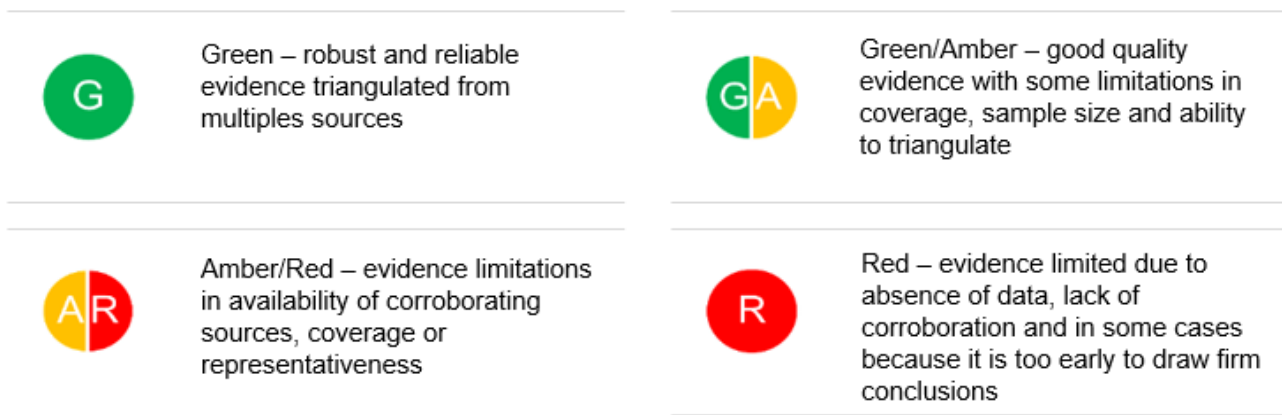



Table 1: Strength of Evidence for the Newton – Utafiti Programme case study

Strength of Evidence	
<p>Green/ Amber</p> 	<p>There are gaps in the evidence, which limited the assessment of relevance, effectiveness, emerging signs of impact and sustainability. This is due to the relatively small sample of interviews conducted which limits the extent to which it is possible to assess if the Newton Utafiti Programme has produced results and benefited its intended recipients. In addition, the extent, type and structure of monitoring data and documentation varied across DPs, limiting the extent to which outputs and outcomes can be reviewed and triangulated.</p>

² Our aim was to achieve a sufficient degree of confidence about the extent to which outcomes have occurred, Newton Fund’s level of contribution to the outcomes and our theory about how the Newton Fund has contributed or failed to contribute. Confidence is affected by the extent of triangulation across sources and the position, knowledge, analytical capacity, and potential biases of primary informants. The ratings are not designed to be a rigid framework, but rather a way to ensure evaluative judgements were made systematically across the Evaluation Questions.

1.6 Report structure

The report is structured as follows:

- Section 2 introduces the context in Kenya, including political and economic developments and trends in the R&I landscape.
- Section 3 discusses high-level emerging results of the Newton Fund in Kenya based on findings from the three sampled projects and broader consultations with the programme team.
- Sections 4 to 6 analyse three specific projects in depth, providing an assessment of the relevance, effectiveness, emerging impact, and sustainability of the sampled activities.

2 Context

2.1 The Newton – Utafiti Fund in Kenya

The Newton-Utafiti Fund launched in 2016. The UK provided £4.5 million in funding from 2016/17 to 2020/21, with £0.5 million provided in the 2016/17 launch year, rising to £1 million annually for the remaining period.³

The Fund covers three out of four priorities of Kenyan government Big Four agenda: *affordable healthcare for all* (in partnership with the Medical Research Council), *food security* (in partnership with Biotechnology and Biological Sciences Research Council) and *manufacturing* (in partnership with the Royal Academy of Engineering). The only one not explicitly covered is *affordable housing*, though the Newton-Utafiti Fund is exploring potential collaborations in this area.

The Fund's objectives are to:

- enhance the role of research and innovation (R&I) for Kenya's global competitiveness and employment creation.
- encourage the adoption of innovative practices in the agriculture and energy sectors.
- and use R&I to reduce Kenya's vulnerability to climate change.

These will be achieved by strengthening human capacity, especially among early career researchers (ECRs), developing multi-disciplinary programmes 'of critical scale', and working with Kenya's National Research Fund (NRF) to enhance domestic perceptions of R&I through its strategic planning process.

At a research level, the Fund's priorities include agriculture and food security, health and life sciences, sustainable and renewable energy, environment and climate change, and wider science and technology capacity-building. Innovation and entrepreneurship is a secondary theme.

Potential risks for the Newton-Utafiti fund identified in the country strategy include challenges in ensuring match funding due to a reduced NRF budget allocation, limited political will to support the partnership, and limited capacity on the part of the NRF, given its recent creation.⁴

A distinctive feature of the Newton Fund is the requirement for matched effort from partner countries, which usually equates to matched funding or in-kind contributions. Matched effort is expected to help jointly accelerate the impact of the Fund's work through the joint agreement of funding priorities and mutual interests, which differentiates it from traditional bilateral development assistance.

³ Newton Fund: Kenya Country Strategy [internal document]

⁴ Newton Fund: Kenya Country Strategy [internal document]

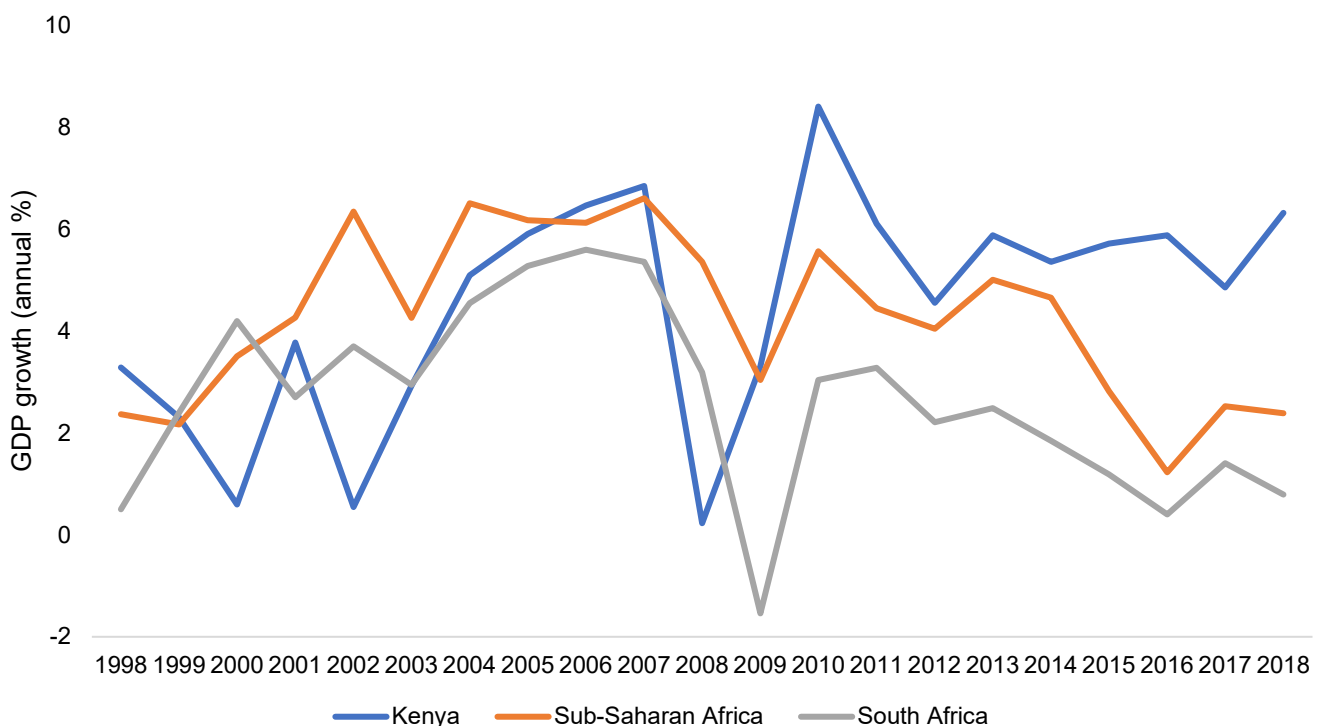
2.2 Political and economic context

Kenya has experienced strong economic growth and poverty reduction in the past decade. This has been accompanied by an increased policy focus on science and innovation.

Kenya is a constitutional presidential republic. Current president, Uhuru Kenyatta, was re-elected in 2017 and leads the Jubilee Party, which formed in 2016 as a merger between 11 political parties previously in coalition.

As shown in Figure 2, Kenya has seen strong gross domestic product (GDP) growth over the past decades and a strong recovery from the global financial crisis in 2008. Since then, Kenya’s economy has been growing at a higher rate than the regional average and regional neighbour South Africa. Kenya has the highest annual population growth (2.3% in 2018⁵) of all Newton Fund countries. Consequently, it has the youngest population, with 39.8% of its citizens aged 0 to 14 in 2018⁶ and a median age of 20.

Figure 2: GDP growth in Kenya, South Africa and sub-Saharan Africa



Source: World Bank

Commodities dominate Kenyan exports: agricultural and horticultural products (including tea at 22% of exports and cut flowers at 9.3%) and mineral products (including refined petroleum at 5.2% of exports).⁷ Kenya also has one of the largest service sectors in the region, which accounts for the largest share of GDP and a large proportion of domestic employment.⁸ Tourism

⁵ World Bank, indicator SP.POP.GROW [Population growth (annual %)]

⁶ World Bank, indicator SP.POP.0014.TO.ZS [Population ages 0-14 (% of total population)]

⁷ Observatory of Economic Complexity (n.d.), 'Kenya'. Available at: <https://oec.world/en/profile/country/ken/>

⁸ US Office of Industries (2017). *The Sub-Saharan African Services Economy: Insights and Trends*. Working Paper ID-046. Available at: https://www.usitc.gov/publications/332/sub-saharan_african_id-17-046_final_071217sae.pdf

is a key industry, contributing 8.8% of GDP in 2018.⁹ Kenya has a significant informal economic sector which accounts for a large portion of the workforce. Kenya is also one of East Africa's main financial hubs.¹⁰

In 2018, the Kenya National Bureau of Statistics estimated that the informal sector accounted for approximately 80% of employment.¹¹ Despite strong economic performance, continuing challenges in infrastructure, security and governance pose barriers to investment. The likely impact of climate change also remains a significant social and economic risk for Kenya.¹²

Kenya has been classified as a lower-middle-income (LMI) economy by the World Bank since 2014.¹³ Kenya is an Overseas Development Assistance (ODA) recipient and received some of its highest-ever rates of ODA in the decade to 2020. However, during this time, the relative importance of ODA decreased in relation to the wider economy. ODA accounted for 2.9% of gross national income in Kenya in 2018, its lowest rate since 1999 and down from 6.1% in 2013¹⁴. Its contribution to central government expenditure also fell from 19% in 2014 to 11.4% in 2018.¹⁵ Kenya issued its first sovereign bond in 2014.¹⁶

Education rates have increased in recent years, with primary completion at 99.7% in 2016 (compared to 87.3% in South Africa)¹⁷. The number of individuals in Kenya who used the Internet in the previous three months remains the lowest of all Newton Fund countries at 22.6% of the population in 2019.¹⁸ Although this figure remains lower than the 56.2% (2017) reported for South Africa, it is important to note that it has almost quadrupled in just one decade (in 2007 the rate was 6.1%).

Despite its economic performance, Kenya continues to have high rates of poverty and unemployment. 37.1% of the population were estimated to live on USD \$1.90 or less each day in 2015 (down from 43.9% in 2005).¹⁹ Kenya also faces challenges relating to health, with high child and maternal mortality and a high burden of disease. It has also experienced food insecurity as a result of climate issues and a volatile energy supply.²⁰

Kenya has also experienced episodes of social unrest and inter-communal violence, notably linked to elections. This included protests in 2007 in response to disputed election results, which resulted in an estimated 1,400 deaths and the displacement of a further 600,000.²¹ In 2017, 50 people were reportedly killed in outbreaks of violence in response to disputed national election

⁹ Nyasuguta, F. (2019). 'Kenya ranked third largest tourism economy in Sub-Saharan Africa'. *The Star* [online], 16 April 2019. Available at: <https://www.the-star.co.ke/business/kenya/2019-04-16-kenya-ranked-third-largest-tourism-economy-in-sub-saharan-africa/> (accessed 06 June 2020).

¹⁰ Central Intelligence Agency (n.d.). World Factbook: Kenya. Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html>

¹¹ Kenya National Bureau of Statistics (2019). *Economic Survey 2019*. Available at: <https://s3-eu-west-1.amazonaws.com/s3.sourceafrica.net/documents/119074/Kenya-National-Bureau-of-Statistics-Economic.pdf>

¹² Central Intelligence Agency, op. cit.

¹³ Central Intelligence Agency, op. cit.

¹⁴ World Bank, indicator DT.ODA.ODAT.GN.ZS [Net ODA received (% of GNI)]

¹⁵ World Bank, indicator DT.ODA.ODAT.XP.ZS [Net ODA received (% of central government expense)]

¹⁶ Central Intelligence Agency, op. cit.

¹⁷ World Bank, indicator SE.PRM.CMPT.ZS [Primary completion rate, total (% of relevant age group)]

¹⁸ World Bank, indicator IT.NET.USER.ZS [Individuals using the Internet (% of population)]

¹⁹ World Bank, indicator SI.POV.DDAY [Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)]

²⁰ Newton Fund Kenya country strategy [internal document].

²¹ BBC News (2013). 'Kenya election: Uhuru Kenyatta wins presidency'. BBC News [online], 09 March 2013. Available at: <https://www.bbc.co.uk/news/world-africa-21723488>

results, with the election later being re-run. Kenya has also experienced incidents of terrorism linked to the Al Shabaab militant group based in neighbouring Somalia.

The UK considers Kenya a key economic and trading partner in the region.²² It is also a strategic security partner in East Africa, given its proximity to UK military operations in Somalia, anti-piracy operations, and the hosting of a British Army Training Unit.²³ The UK was the fifth largest destination for Kenya's exports in 2018 (at 6.5% of exports, behind Uganda, Pakistan, USA and the Netherlands), but provided only 2.6% of imports, the seventh-largest country of origin (with all larger import partners, except South Africa, being Asian countries, including China at 24% of imports).²⁴

In addition to the Newton Fund, a number of UK funding programmes also operate in Kenya, including the Global Challenges Research Fund (GCRF), the Prosperity Fund (until March 2021), the Fleming Fund, and several bilateral Foreign, Commonwealth and Development Office (FCDO) programmes.²⁵ Nairobi also hosts the FCDO's East Africa Research Hub.

2.3 Research and innovation landscape

Kenya has placed a strong emphasis on science and technology in its economic development plan, aiming to increase value-added activity in target sectors, notably manufacturing and agriculture. The 2010 constitution recognises “the role of science and indigenous technologies in the development of the nation”.²⁶

In 2008 the Kenyan government launched Vision 2030, an economic development strategy that aims to support Kenya's transition to a middle-income economy by 2030. Vision 2030 sets out priorities within key pillars: social, political, economic, and a foundations pillar, which focuses on aspects such as security, infrastructure and human capital.²⁷ Activities are planned and implemented in five-year plans. The government has summarised the Big Four target areas for the Third Medium Term Plan (MTP III) 2018-2022 as ensuring food security, providing affordable housing, developing the manufacturing sector, and providing affordable universal healthcare.²⁸

Vision 2030's five-year plans have included a science, technology and innovation (STI) theme under the foundations pillar, accompanied by a sector plan.²⁹ Acknowledging the need to develop the value-added and knowledge-based sectors of the economy, the sector plan notes a need to “*identify sector priorities and determine the strategic technology platforms required to*

²² Newton Fund Kenya Country Strategy [internal document]; as of 2020, the UK-Kenya relationship was announced to be a 'Strategic Partnership' from 2020-2025 by UK Prime Minister Boris Johnson and President Kenyatta.

²³ HM Government (2015). *National Security Strategy and Strategic Defence and Security Review 2015*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/555607/2015_Strategic_Defence_and_Security_Review.pdf

²⁴ Observatory of Economic Complexity, op. cit.

²⁵ FCDO (n.d.). 'DFID Kenya'. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913359/Kenya-Profile.pdf

²⁶ Republic of Kenya (2010). Constitution of Kenya. Available at:

<http://www.kenyalaw.org/8181/exist/kenyalex/actview.xql?actid=Const2010>

²⁷ See: <https://vision2030.go.ke/>

²⁸ Kenya Vision 2030. 'Towards 2030'. Available at: <https://vision2030.go.ke/towards-2030/>

²⁹ Republic of Kenya (2013). *Sector Plan for Science, Technology and Innovation 2013 - 2017*. Available at: <http://research.tukenya.ac.ke/images/Sector-Plan-for-Science-and-Technology.pdf>

*address those priorities... This calls for the rationalisation, re-structuring and establishment of STI institutions to make them more effective in addressing national priority needs in order to build a robust national innovation system that uses product oriented multi-disciplinary approaches to become globally competitive”.*³⁰

In a 2015 review of the STI landscape for the second-term plan, the Ministry of Education identified a number of limitations relating to STI policy. These included:

- a lack of an integrative policy framework and national research agenda to align STI policy with the economy.
- ineffective coordination between government, researchers and the private sector.
- a lack of research infrastructure and equipment.
- a skills gap in relation to industry needs.
- lack of advocacy for STI at high political and policy levels.
- a fragmented innovation system, with low commercialisation rates and a complex intellectual property (IP) process.
- a lack of mechanisms for evaluation and review.³¹

The government has therefore set out a number of explicit targets for STI, including:

- targets relating to specific sectors, such as increasing value-added economic activity, including through the development of the manufacturing sector, training of engineers and the development of the Kenya Industrial Research and Development Institute (KIRDI) into a world-class research institution.
- developing agricultural technologies and innovation.
- improving the monitoring, evaluation and learning system, including implementing STI indicator surveys and knowledge systems.
- improving science, technology, engineering and mathematics (STEM) education and workforce skills.
- developing the capacity of key STI and research institutions.
- establishing the Konza Technology City science park and business district to encourage the business process outsourcing sector.

2.4 Overview of R&I funding structure

³⁰ Republic of Kenya (2013). *Sector Plan for Science, Technology and Innovation 2013 – 2017* op. cit.

³¹ Republic of Kenya (2013). *Vision 2030: Medium Term Plan II: Education and Training 2013 - 2018*. Available at: <http://www.jkuat.ac.ke/directorates/dipca/wp-content/uploads/2015/07/Education-and-Training-MTP2.pdf>

Kenya has implemented significant changes to its science, technology and innovation landscape over the evaluation period, following a 2013 reorganisation of STI coordination bodies, although many initiatives remain in development.

Kenya has a long history of science and research activities. This includes a number of research institutes established by the British colonial government and, following independence in 1963, the passing of the first Science and Technology Act (1977), which established research advisory councils and the National Council for Science and Technology (NCST), as a policy development and coordinating body.³² Five public research institutes were subsequently established between 1979 and 2016 to research the forestry, agriculture, medical, industrial, and marine and fisheries fields.

In 2013, the Kenyan Parliament passed the National Science, Technology and Innovation Act, which introduced a number of measures to improve science and technology coordination, including setting a target of gross domestic expenditure on research and development of 2% (up from 1% in 2010)³³ and establishing key coordinating bodies such as the National Research Fund (NRF)³⁴ and National Commission for Science Technology and Innovation (NACOSTI)³⁵ to replace the former NCST. In 2015, a State Department of Information Communications and Technology and Innovation was established at the Ministry of Information, Communications and Technology.³⁶

NACOSTI develops strategic plans for science, technology and innovation in Kenya, which align with the five-year plans under Vision 2030.³⁷ NACOSTI achievements during the Newton Fund evaluation period (as identified by an internal review for the 2018 to 22 planning phase) are listed in Table 2. As acknowledged by the government, NACOSTI and other agencies were in a learning and transition period during this time. They faced specific challenges relating to inadequate human resource capacity, underfunding of NACOSTI's activities, and low automation levels, which had a "*negative impact... on service delivery*".³⁸ Other challenges included delayed service delivery due to centralisation, inadequate resource mobilisation

³² Hanlin, R. (2017). *The political economy of the Kenyan science granting councils*. Available at: <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/56812/IDL-56812.pdf>

³³ UK Science & Innovation Network (n.d.). *Country Snapshot: Kenya*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/564062/Kenya_Country_Snapshot_-_On_Template_-_30.9.16.pdf

³⁴ The National Research Fund (NRF) was established in 2014 as the main domestic research funding body for Kenyan research, providing postgraduate scholarships, allocating funding for research projects, conferences and institutions, and coordinating international research collaborations. In addition, it has provided infrastructure development grants to create research centres in specific areas. National Research Fund (n.d.) 'National Research Fund'. Available at: <https://researchfund.go.ke/> and Karikari, T. K., & Amoteng, P. (2018). Kenya and Ghana set up national research funding schemes. *Nature*, 557(7706), 166-167.

³⁵ The National Commission for Science Technology and Innovation (NACOSTI) was established in 2013 to coordinate STI activity and policy in Kenya, and replaced the former NCST.³⁵ NACOSTI has a broad remit, including managing the accreditation and licensing of research institutions and individuals, setting research priorities, providing quality assurance, and developing STI policies. NACOSTI (n.d.), 'History'. Available at: <https://www.nacosti.go.ke/index.php/about-us/history>; NACOSTI (n.d.), 'Mandate and Functions'. Available at: <https://www.nacosti.go.ke/index.php/mandate-functions>

³⁶ Mucheru, J. (2016). 'Action Plans and Road Maps for Science, Technology and Innovation for Sustainable Development Goals and Enabling Both Youth and Women Innovators in Kenya'. Presentation at the Ministerial Dialogue: Towards A Roadmap of Effective Science, Technology and Innovation (STI) Policy, 7th June 2016, United Nations Headquarters, New York. Available at: <https://sustainabledevelopment.un.org/content/documents/212341%20Kenyan%20Minister.pdf>

³⁷ NACOSTI (2018). *Strategic Plan 2018-2022*. Available at: <https://www.nacosti.go.ke/images/docs/2019/NACOSTI%20STRATEGIC%20PLAN.pdf>

³⁸ Ibid.

leading to slow implementation, and weak coordination frameworks. The 2018 to 2022 Strategic Plan includes a number of measures to tackle these.³⁹

Table 2: NACOSTI achievements 2014-2018

Goal	Achievement (as reported by NACOSTI)
To improve the quality of research and development outputs	<ul style="list-style-type: none"> • Creation of the Research, Accreditation and Quality Assurance Directorate. • Regulations and guidelines developed and implemented. • Registration of research institutions. • Licensing of research projects. • Monitoring and evaluation of research programmes.
To provide research, science, technology and innovation policy advisory services	<ul style="list-style-type: none"> • Provision of policy and strategy advice to national and regional institutions. • Provision of advisory on four emerging technologies, namely: Nanotechnology, Biotechnology, Space science and Nuclear energy.
To harmonise efforts towards research, science and technology development	<ul style="list-style-type: none"> • Development and implementation of a national research agenda. • Coordination of research programmes under the International Atomic Energy Agency, Comprehensive Test Ban Treaty Organization, Biological and Toxin Weapons Convention and International Centre for Genetic Engineering and Biotechnology.
To popularise research, science, technology and innovation	<ul style="list-style-type: none"> • Awareness-creation through various fairs and fora.
To strengthen institutional capacity to deliver on the mandate of the Commission	<ul style="list-style-type: none"> • Development and implementation of a Human Resource Policies and Procedures Manual. • Completion of the construction of the office complex. • Continuation of the ISO 9001: 2008 and transition to ISO 9001: 2015.⁴⁰

³⁹ Ibid.

⁴⁰ This refers to a standard for quality management practices for knowledge-intensive organisations

<p>To mobilise resource and promote investment in ST&I sector</p>	<ul style="list-style-type: none"> • Increase of Appropriations in Aid from KES 14.9 million in 2013/2014 to KES 24 million in 2017/2018.⁴¹ • Increase in Government support through recurrent budget grants from KES 234 million in 2013/14 to KES 271 million in 2017/18.⁴²
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Source: NACOSTI 2018-22 Strategic Plan

As part of the new MTP III, NACOSTI has also set specific research objectives for the 2018 to 2022 period, which are aligned with the Big Four agenda with an additional objective of developing Kenya’s academic and research capacity.⁴³ The devolved county system and the role of NACOSTI as a focal point for various collaboration treaties have been identified as opportunities for international partnerships and the development of region-specific science and technology.⁴⁴ The plan acknowledges the need to create partnerships to offset the high cost of research infrastructure and low foreign direct investment (FDI) in research and development (R&D), as well as a need to diversify sources of funding to avoid reliance on a constrained central government budget.⁴⁵

The development plan also encourages innovation in the private sector, including the 2016 launch of the Kenya National Innovation Agency (KENIA)⁴⁶. A number of global technology firms have established bases in Nairobi, and incubators, accelerators and venture capital firms have increased.⁴⁷ A number of state agencies, including the Kenya Industrial Estates Limited, Kenya Industrial Property Institute and the Information and Communication Technology Authority, provide different forms of support to industry to encourage innovation and information and communications technology (ICT) adoption,⁴⁸ and NACOSTI also undertake some activities to encourage adoption of ICT in the business sector.⁴⁹

Several factors hindering private research and innovation in Kenya have been identified. These include limited infrastructure for research, science and technology development, insufficient funding, a complex IP system,⁵⁰ challenges for MSMEs in engaging with the education and research sector, and a limited contribution from the private sector for research and technology

⁴¹ Approximately £111,000 to £179,000 in GBP as of 05 June 2020 (2020 prices)

⁴² Approximately £1.75m to £2m in GBP as of 05 June 2020 (2020 prices)

⁴³ Republic of Kenya Ministry of Education (2019). National Research Priorities 2018 - 2022. Available at: <https://www.nacosti.go.ke/images/docs/2019/National%20Research%20Priorities.pdf>

⁴⁴ NACOSTI *Strategic Plan 2018-2022*.

⁴⁵ Ibid.

⁴⁶ The Kenya National Innovation Agency (KENIA), an agency established in 2013 (active since 2016) to develop Kenya’s innovation activity, including nurturing innovation capacity at devolved county level. KENIA is intended to provide some funding for innovation activity, including commercialisation activities. See, Republic of Kenya (2013). *Sector Plan for Science, Technology and Innovation 2013 – 2017* op. cit. and Ayisi et al (2019) op. cot.

⁴⁷ UK Science & Innovation Network (n.d.) op. cit.; DW Akademie (n.d.) ‘Finding digital solutions to local problems, Kenya’s innovation scene is no one-hit wonder’. Available at: <https://www.dw.com/en/finding-digital-solutions-to-local-problems-kenyas-innovation-scene-is-no-one-hit-wonder/a-47119339>

⁴⁸ Mrkajic, B. (2018). *Country Overview: Kenya*. Available at: http://community.africanlead.net/pluginfile.php/222/mod_folder/content/0/Kenya.pdf

⁴⁹ NACOSTI (n.d.), ‘Capacity development’. Available at: <https://www.nacosti.go.ke/index.php/programmes/capacity-development>

⁵⁰ As of 2020, a new IP bill is at consultation stage.

development.⁵¹ In 2010, the proportion of R&D funding from international sources was estimated to be 47.1%, significantly above that of South Africa at 12.1%.⁵²

Under the Vision 2030 programme, legislative acts were passed in 2014 to develop the vocational education and university sectors and establish a Commission for University Education (CUE). Kenya has a number of public and private universities, including some specialising in STEM subjects⁵³ and a number of long-standing specialised research institutes.⁵⁴ In 2017, tertiary enrolment was 11.5% of the reference group, the lowest of all Newton Fund countries and half of that of South Africa (at 22.4%) but a significant increase from the 2009 figure of 4%.⁵⁵ However, commentators have noted an emphasis on teaching rather than research in universities as an income-generating activity.⁵⁶

2.5 Overview of research and innovation funding structure

The Ministry of Education retains overall institutional control for STI policy within Kenya and oversight of the tertiary and vocational education sectors.⁵⁷ In a 2015 review of the STI landscape for the second-term plan, the Ministry of Education identified insufficient research funding as a key challenge faced during implementation of the first MTP, specifying that it was “donor-driven, fragmented, and uncoordinated”, and as such unable to effectively reflect priorities at national level.⁵⁸

These challenges underpinned the 2013 reorganisation of STI coordination bodies. Three organisations under the Ministry oversee national research coordination, priority-setting and funding decisions: **NACOSTI, NRF and KENIA**. As discussed below, Kenya also receives a large amount of foreign research funding through its high level of collaboration with foreign research institutions. Other key ministries in the research space include the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Health and the Ministry of Industry, Trade and Cooperatives, which also commission research projects.⁵⁹

2.6 International relations and research collaboration

⁵¹ United Nations Economic Commission for Africa (2018). *A framework for assessing science, technology and innovation readiness in African countries: Country STI Profiles*. Available at: <https://www.uneca.org/country-sti-profiles-framework-assessing-science-technology-and-innovation-readiness-african>; NACOSTI Strategic Plan 2018-2022; Republic of Kenya (2013). *Vision 2030: Medium Term Plan II: Education and Training 2013 - 2018*. op. cit.

⁵² Beaudry, C. et al. (2018). *The Next Generation of Scientists in Africa*. Available at: <http://www.africanminds.co.za/wp-content/uploads/2018/10/AM-The-Next-Generation-of-Scientists-in-Africa-TEXT-WEB-11112018-1.pdf>

⁵³ United Nations Economic Commission for Africa (2018), op. cit.

⁵⁴ UKCDR (2020). *UK Research Funding for Development in Kenya: An analysis of funding and reach (2014-2019)*. Available at: <https://www.ukcdr.org.uk/wp-content/uploads/2020/01/UKCDR-UK-research-funding-report-Kenya-Jan-2020.pdf> (accessed 23 February 2021); Ayisi et al (2019). *Assessing the Potential for Transformative Innovation Policy in Kenya*. Available at: <http://www.tipconsortium.net/wp-content/uploads/2019/07/Kenya-5-pager.pdf>

⁵⁵ World Bank, indicator SE.TER.ENRR [School enrolment, tertiary (% gross)]

⁵⁶ Mrkajic, B. (2018), op. cit.

⁵⁷ UKCDR (2020), op. cit.

⁵⁸ Republic of Kenya (2013). *Vision 2030: Medium Term Plan II: Education and Training 2013 - 2018*. op. cit.

⁵⁹ UKCDR (2020), op. cit.

Kenya is a regional hub for science cooperation in East Africa, often on specific areas of bilateral interest. For example:

- the Netherlands implements a series of research and innovation programmes in the agricultural sector.⁶⁰
- the Swedish International Development Cooperation Agency (SIDA) supports the Bio-resources Innovations Network for Eastern Africa Development (Bio-Innovate) Programme, based in Nairobi's International Centre of Insect Physiology and Ecology.⁶¹
- France operates three scientific research institutes in Kenya and has established a number of university links.⁶²
- Kenya participates in the German Deutscher Akademischer Austauschdienst scholarship scheme and in 2017 signed a memorandum of understanding (MoU) with Germany to set up an East African-German university of applied sciences.⁶³
- the EU's 2013 to 2016 CAAST-NET PLUS scheme, funded by the Seventh Framework Programme (FP7) framework, also developed a network of research innovation partners across sub-Saharan Africa and the EU, including MOHEST.⁶⁴
- Japan actively funds research activities, including the Japan Society for the Promotion of Science research station in Nairobi.⁶⁵
- South Korea funds the Kenya Advanced Institute of Science and Technology (Kenya Kaist) which is scheduled to open in 2021 with three faculties initially: Mechanical, Electrical and ICT Engineering, Chemical Civil and Agriculture Engineering/Biotechnology, and Basic Science Education.⁶⁶
- China and Kenya signed an MoU in 2018 to promote scientific cooperation,⁶⁷ and in 2018 opened the Chinese-funded Sino-Africa Joint Research Centre in Nairobi, which leads joint research projects in scientific fields.⁶⁸ The Jomo Kenyatta University of Agriculture and

⁶⁰ Kingdom of the Netherlands (n.d.). 'Agriculture and food: the Netherlands and Kenya'. Available at: <https://www.netherlandsandyou.nl/about-the-kingdom/agriculture-and-food/kenya>

⁶¹ BioInnovate Africa (n.d.). 'About Us'. Available at: <https://bioinnovate-africa.org/about-us/>

⁶² Ministère de l'Europe et des Affaires Étrangères (n.d.). 'France in Kenya and Somalia: University and scientific cooperation'. Available at: <https://ke.ambafrance.org/University-and-scientific-cooperation>

⁶³ NACOSTI (n.d.), 'Collaborations and Partnership'. Available at: <https://www.nacosti.go.ke/index.php/programmes/collaborations-and-partnership>; Federal Foreign Office (2019), 'Germany and Kenya: bilateral relations'. Article published 30 September 2019. Available at: <https://www.auswaertiges-amt.de/en/aussenpolitik/laenderinformationen/kenia-node/kenya/228906>

⁶⁴ CAAST-Net Plus (n.d.). CAAST-NET PLUS. Available at: https://africa-eu-partnership.org/sites/default/files/documents/cnbrochure5benglish5d_v6-web_1.pdf ; <https://www.africa-eu-sti-portal.net/en/589.php>

⁶⁵ Japan Society for the Promotion of Science Nairobi Research Station (n.d.). 'Bilateral research programs'. Available at: <https://www.jspsnairobi.org/en/bilateral-programs>

⁶⁶ Nation (2019). 'Korean Sh10bn Konza university to open in 2021'. Nation [online], 13 February 2019. Available at: <https://www.nation.co.ke/business/Korean-Sh10bn-Konza-university-to-open-in-2021/996-4980748-sskfv9z/index.html>

⁶⁷ Xinhua (2018). 'Kenya, China sign MOU to promote cooperation in science, innovation'. Xinhuanet [online], 13 December 2018. Available at: http://www.xinhuanet.com/english/2018-12/13/c_137672299.htm

⁶⁸ SAJOREC (n.d.). 'About SAJOREC'. Available at: <http://www.sinafrica.cas.cn/English/About/Introduction/>

Technology is a member of China's Alliance of International Science Organisations as part of its Belt and Road development initiative.⁶⁹

- the USA supports public health-related research and laboratory systems through the Centres for Disease Control and Prevention⁷⁰. In 2015, Canada's International Development Research Centre established a co-financing programme with NACOSTI to fund a programme of university research chairs in priority areas.⁷¹

Kenya also participates in some regional initiatives, including the African Resource and Environment Management Satellite constellation initiative with Algeria, Nigeria and South Africa; the Africa Regional Cooperative Agreement for Research Development and Training related to Nuclear Science and Technology,⁷² the Partnership for Skills in Applied Sciences, Engineering and Technology Regional Scholarship Fund,⁷³ and the Square Kilometre Array project, a collaboration between 15 countries (including the UK) to build the world's biggest distributed radio telescope across Australia and nine African countries (including a node in Kenya).⁷⁴

⁶⁹ ANSO (n.d.). 'ANSO Governing Board Members'. Available at:

<http://www.anso.org.cn/membersNetworks/members/>

⁷⁰ Centers for Disease Control and Prevention (n.d.). *CDC in Kenya*. Available at:

https://www.cdc.gov/globalhealth/countries/kenya/pdf/Kenya_Factsheet.pdf

⁷¹ Waruru, M. (2015). 'Kenya embraces research chairs programme to drive R&D'. *University World News: Africa Edition* [online], 01 May 2015. Available at:

<https://www.universityworldnews.com/post.php?story=20150501064522670>

⁷² NACOSTI (n.d.), 'Collaborations and Partnership'. Available at:

<https://www.nacosti.go.ke/index.php/programmes/collaborations-and-partnership>

⁷³ Partnership for skills in Applied Sciences, Engineering and Technology (n.d.). 'The PASET Regional Scholarship and Innovation Fund'. Available at: <https://www.rsif-paset.org/>

⁷⁴ South African Government (n.d.). 'Square Kilometre Array (SKA)'. Available at: <https://www.gov.za/about-government/government-programmes/square-kilometre-array-ska>

3 Emerging results of the Newton-Utafiti Fund in Kenya

This section sets out the emerging results of the Newton – Utafiti Fund. The findings are based on the three calls included as part of the case study as well as the broader consultations undertaken with the programme team (see Section 1.4 for details of the methodology).

3.1 Key Findings

Interviewees widely perceive the Newton-Utafiti Fund as a useful and valued funding partnership. They spoke highly of the Fund and indicated that it had funded useful projects closely aligned with Kenyan government priorities and had received good buy-in from senior Kenyan government stakeholders. As a result, the Newton Fund was perceived to be working particularly well in Kenya.

The Newton-Utafiti Fund is also perceived to have begun at an opportune moment in which Kenya has prioritised the use of science and technology collaboration to achieve broader development goals. As noted above, Kenya has reorganised its science funding landscape in recent years, including launching the NRF and KENIA and increasing the R&D budget. In addition to the Newton-Utafiti Fund, a number of new Kenya-UK initiatives have come online. These include the establishment of a Joint UK-Kenya Oversight Board in Science, Research and Innovation in 2018, chaired by the Kenyan Minister for Education and the British High Commissioner.

The Fund is seen as having been a valuable tool in wider science partnerships and diplomacy during this time. The Newton-Utafiti Fund is seen as having given the UK a ‘place at the table’ during the development of the new science and research strategies by enabling it to back up the ideas and priorities discussed with the Kenyan government with a clear funding commitment:

“It’s empowered [High Commission staff] to back things up. So rather than just going in and talking about ‘UK is great, why don’t you work with us’, it’s actually giving [them] some opportunities to say ‘and look, here’s some possibilities of actually how you can do that’ – so putting money behind the rhetoric.”

Interviewees also highlighted the benefit of having an in-country team (ICT) based in the high commission. This enabled staff to track implementation locally, develop on the ground relationships and support Kenyan DPs and project teams. One interviewee noted that a condition for the sustainability of the Newton-Utafiti Fund would be the preservation of this kind of knowledge once the existing ICT has moved on, although they noted that they felt the elements were now in place for a longer-term relationship.

Multiple interviewees emphasised a key strength of the Fund being that it was set up as an equitable partnership. Interviewees noted that this approach contrasts with other UK-funded programmes that are often pitched ‘ready-developed’ to the Kenyan government or other donor-funded research grants which do not necessarily align closely with Kenyan priorities.

"I think I felt for the first time this was something that was truly truly truly mutual. And that goes to explain why we had a good reception from government. And it was not hard [to work with] government or finding government officials to help... because they have put their money in the pot, the UK has put their money in the pot, and... it's addressing what Kenya had [identified as] their interest."

"Recipients and the Ministry [have]... appreciated the time taken to work on a partnership, rather than say 'this is what [the UK is] good at, this is what we've got money for, so this is what you're going to do.'"

In turn, the joint funding commitment was seen as enabling senior buy-in on the part of Kenyan stakeholders. One interviewee noted that the match funding had been a source of confusion initially as stakeholders had been receiving direct Department for International Development (DFID) funding for a long time, but that there was high level buy-in once stakeholders understood that Kenya would have co-ownership of funding priorities. Because funding was drawn from Kenyan taxpayers, one interviewee felt that this meant that Newton-Utafiti had gained more political acceptance, even if disbursing smaller amounts than traditional DFID (now FCDO) funding.

At the project level, interviewees also highlighted the value of the partnership model. One interviewee noted that in some collaborations northern partners emphasise that funds are provided by their own taxpayers in a way that could be perceived as condescending. However, this was not the case with the Newton – Utafiti Fund, given the substantial contribution from Kenya. However, interviewees from two projects also highlighted that the Kenyan government's contribution to funding was not fully appreciated or understood by participants, one attributing this to the emphasis placed on branding projects rather than their funders.

The result of this partnership approach meant that activities were closely aligned with key Kenyan government priorities. Newton-Utafiti priorities were set in line with Kenya's Vision 2030 programme and its priorities for poverty alleviation, capacity building and job creation. The Fund's flexibility meant that it could be pivoted to align with President Kenyatta's 2017 Big Four agenda, which was felt to be a strength as it demonstrated a clear commitment to Kenya's priorities.

One interviewee emphasised how the focus on joint priority-setting **enabled money to reach smaller and rural universities, which otherwise are often unable to attract the same level of international funding** as their more prominent Nairobi-based counterparts, despite having strong research faculties. This was attributed to a deliberate effort on the part of the NRF to ensure that funding was distributed to these institutions. An indication that this strategy has worked is provided by the fact that two Kenyan candidates for the Newton Prize were drawn from these smaller universities.

The flexibility and smaller grants offered by the Newton Fund were seen as a useful differentiator to other funding sources, including the GCRF. Interviewees noted that whereas the Newton-Utafiti grants were small, they were able to fund early-stage collaborations and so were able to open doors to researchers in Kenya to apply for larger grants from funds such as the GCRF (with some Newton-Utafiti collaborations subsequently securing GCRF funding):

"I think because Newton is very small and context-specific compared to the big calls... Newton Fund has been able to bring early-career researchers together... able to fund small projects

who have gone on to receive more money from GCRF, and also, for example, Horizon 2020... That smaller money is needed here in Kenya, and that's the space that Newton has been able to really speak to."

These characteristics are perceived to have contributed to high levels of additionality – with the projects reviewed for this case study unlikely to have occurred without the Fund. Respondents reported that it would have been difficult to obtain funding from other sources. For example, while projects funded under the Medical Research Council (MRC) call were very small in comparison to GCRF projects, they were considered highly context specific. LIF participants reported that they would have struggled to secure funding for early-stage innovations by other means, as further explained in Section 6.

There were also benefits for Kenyan institutions. Interviewees noted that staff at the NRF and KENIA, both very young institutions, had benefited from exchange programmes and contacts with UK institutions. Other interviewees noted however that there was a role for the Fund to support capacity-building for Kenyan institutions, in particular to tackle wider barriers to R&I, such as universities' capacity to promote knowledge transfer.

The collaborative nature of the partnership was also seen to benefit the UK. Interviewees also noted that the act of developing and implementing the Newton-Utafiti Fund had benefits for Kenya-UK government relations (unlike, for example, the centralised structure of the GCRF, which results in fewer government-to-government contacts). Resulting soft power benefits include enabling the UK to engage with Kenya as it reformed its science landscape, developing relationships with Kenyan institutions and cementing its role as a trusted science partner. The Fund has also featured in high-level diplomatic exchanges between the Kenyan and UK governments, including a meeting between Newton-Utafiti grantees and then-UK Prime Minister Theresa May in August 2018.

There are likely to be longer term benefits, for instance, as Kenyan beneficiaries become familiar with the UK at an important stage in their career, encouraging them to turn to UK actors for future academic or commercial partnerships. However, multiple interviewees noted that the potential to translate soft power into long-term benefits will **depend on the UK's ongoing presence in this field.**

3.2 Challenges and lessons learned

While appreciated as part of a joint commitment and joint delivery, there were difficulties in making match funding arrangements work at the start of the Fund. There was limited guidance on what matched funding and effort meant in practice and how it should be calculated. This required negotiations between project partners on issues such as defining in-kind funding. This lack of shared understanding of matched effort meant that some early ideas for projects could not go ahead, despite interest on the part of both UK and Kenyan Delivery Partners. However, these problems were resolved over time, once expectations and understanding of matched funding were clarified.

The fact that the Kenyan DPs, KENIA and NRF, had only recently been established also created challenges for implementation. Both organisations had been rolled out only recently during the reorganisation of the STI landscape, and for the first few years, were dependent on small numbers of seconded staff. As a result, the ICT sometimes had to step in to support implementation. The Fund also encountered challenges in aligning budget and finance plans between the UK and Kenyan partners. Notably, as the R&D budget within Kenya was not

ringfenced, the country partners had to bid for internal funding each year. This was straightforward at the start of the Newton Fund when the R&D budget had just been increased, but it decreased in subsequent years.

Similarly, a further challenge was funding being released and spending tracked on a quarterly basis in Kenya, which did not align with the sometimes months-long call periods that spanned across Kenyan budget periods, thereby causing some planning issues. An interviewee identified two projects which had been prevented from starting due to these issues. The difference in financial years – with Kenya’s beginning in July, and UK institutions beginning in April – also posed some challenges. One interviewee felt that the need to commit funding within a specific financial year had resulted in projects being established in a rush, before ideas had been fully developed.

Multiple interviewees identified delays in securing operational agreements as challenges. While an overarching MoU governs the Newton-Utafiti Fund, agreements between specific Delivery Partners are governed by Operational Activity Agreements (OAAs), which were primarily required by UK DPs. It proved time consuming and labour intensive for Kenyan DPs to obtain these, as all legal agreements in Kenya have to go through a number of government offices to be signed, potentially causing delays to new projects. Kenyan participants suggested that UK DPs should be more flexible about the form of agreement used to avoid similar delays in future.

4 Project: Improving food security and nutrition in Kenya: Strengthening indigenous leafy vegetables research and innovation capacity

Summary

Project title	Improving food security and nutrition in Kenya: Strengthening Indigenous Leafy Vegetables research and innovation capacity
Call title	Researcher Links workshop
Short description	The workshop on <i>Improving food security and nutrition in Kenya</i> was held in September 2018 in Nyeri, Kenya, under the Researcher Links programme to develop partnerships between UK and partner country researchers. The workshop was run by a partnership between Harper Adams University, a specialist UK agricultural university, and the Institute of Food Bioresources Technology at Dedan Kimathi University of Technology (DeKUT).
Objective(s)	<p>The Researcher Links programme aims to bring together researchers from the UK and partner countries to encourage the development of international connections.⁷⁵ This project was funded under a specific call for workshops.</p> <p>The workshop's objective was to develop the research field of indigenous leafy vegetables (ILVs) help mitigate nutrition deficiencies and strengthen food security in Kenya. The workshop aimed to develop human capacity and new research partnerships on ILVs in Kenya, including translating existing UK ILV research to the Kenyan context. The workshop developed an ILV strategic research and innovation plan to address the various barriers to developing ILV production and markets.</p>
Pillar	People

⁷⁵ British Council (n.d.). 'researcher Links'. Available at: <https://www.britishcouncil.org/education/science/researcher-links>

Action value (total budget allocated in country, in GBP)	UK: £ 8,616 Kenya: £ 12,450
Start/end date (Status: on-going or complete)	February 2018 to January 2019
DP UK and overseas	British Council – National Research Fund
Award holders/ grantees	Harper Adams University; Dedan Kimathi University of Technology

Description of the project

The Researcher Links programme is an initiative under the Newton Fund’s **People Pillar** to bring together researchers from the UK and partner countries to encourage the development of international connections.⁷⁶ Participants are primarily expected to be early career researchers (ECRs), in addition to workshop mentors (experienced researchers).

The workshop in question was a collaboration between Dedan Kimathi University of Technology (DeKUT) in Nyeri, Kenya, and Harper Adams University, a specialist agricultural university in the UK. While ILVs are considered a good source of micronutrients, they have been underexploited as a foodstuff due to barriers such as limited seed production and quality, subsistence-level farming practices, lack of appropriate crop processing and preservation methods, limited knowledge of ILVs, and limited development of the ILV value chain.⁷⁷ The Kenyan Principal Investigator (PI), Dr Eddy Owaga, had been working on this topic, but overall, ILV research remains an emerging field of study within Kenya.

The workshop aimed to develop human capacity and new partnerships to develop research programmes and promote ILVs within Kenya. 20 ECRs were selected to participate in the workshop.⁷⁸ Participants applied and were selected by Dr Owaga and UK PI Dr Jim Monaghan through a ranking mechanism. Travel, subsistence and accommodation expenses incurred by participants were covered by the grant, in addition to wider workshop costs. ECRs were also encouraged to present their work. Participants included a number of researchers currently based at a UK or Kenyan institution but who were citizens of other countries, including Malaysia, France and Ghana.

Pathway to impact

As shown in Annex 4 Figure 4, this project fits within the Theory of Change for Newton Fund People Pillar activities by aiming to provide professional development opportunities for ECRs in

⁷⁶ Ibid.

⁷⁷ CCRI, ‘Damian Maye strengthening Indigenous Leafy Vegetables (ILV) research in Kenya’ Available at: <https://www.ccri.ac.uk/dmkenya/>

⁷⁸ Harper Adams University (2018). ‘Harper researchers encourage developing new crops from traditional East African plants to improve food security in Kenya’. Article, 05 October 2018. Available at: <https://www.harper-adams.ac.uk/news/203300/harper-researchers-encourage-developing-new-crops-from-traditional-east-african-plants-to-improve-food-security-in-kenya>

Kenya and the UK. However, it is also relevant to the Research Pillar by providing support for research dialogue and networking to encourage the development of long-term links.

The **inputs** for this project were just over £20,000 in funding to support the international workshop with participation by ECRs and mentors from Kenya and the UK.

This project's main **activity** was the workshop itself, held from 10 to 13 September 2018 in Nyeri, Kenya. This included introductory sessions, skills mapping sessions, a field visit to local producers, presentations by ECRs and mentors on various topics, a mapping session to explore barriers and challenges to ILV production, assessment of research needs and priorities, value chain mapping and analysis, and discussion on ILV advocacy, communication and social mobilisation strategies.

The **outputs** for this project included launch of a UK-Kenya African Indigenous Vegetables Research Network (based on LinkedIn).

The **expected outcomes** for this project are improved international networks that lead to follow-on funding and projects in the ILV field and develop skills and connections among early-career researchers.

In terms of **potential impact**, this project aims to improve capacity in Kenya and globally to develop markets for ILVs through further research on the topic, thereby leading to increased food security, improved nutrition and the nurturing of domestic food production industries.

4.1 Emerging project results

Relevance of Newton Fund activities

Relevance of the collaboration to Kenya's socio-economic priorities

The workshop was highly relevant to Kenya's priorities. The Researcher Links programme itself was adapted to the Kenyan context through a consultation process that set priorities and enabled the Kenyan government to disburse funding itself (rather than through the British Council, as in other programme countries). The workshop selection process ensured that selected projects were relevant to Kenya's priorities, avoided overlap with existing research in Kenya and focused on important research niches that would not otherwise be addressed. In particular, the focus of the project on food security fits well within the Newton Fund priorities in Kenya and Kenya's own Vision 2030 agenda.

Interviewees also emphasised the value of the specific focus on ILVs as a field of study.

The interdisciplinary nature of the workshop – which involved attendees from scientific fields (such as geneticists and nutritionists), relevant to supply chains (such as marketing and business researchers) as well as policymakers – was particularly valued by interviewees, who noted that research in this field can often be conducted in silos. This enabled a focus on the holistic development of the field within Kenya while also bringing in specialised knowledge from the UK (particularly on genetics) to complement the local knowledge of the Kenyan context. The workshop's nature as an opportunity to explore new research areas, generate ideas and explore the potential for future collaborations (rather than simply aiming to answer a pre-set research question) was also cited as a strength by interviewees.

In addition, the workshop complemented ongoing work in this field by the British Council to set up UK and Kenyan research links. While the British Council had been administering a number

of scholarship programmes, they had been getting feedback from Kenyan researchers asking for other opportunities for ongoing links with the UK, such as exchanges. The introduction of Newton Fund in 2016 was therefore seen as timely and a way to expand the existing Researcher Links and Institutional Links programmes.

ODA relevance

The collaboration is highly relevant to ODA objectives. This collaboration aims to make a clear contribution to Kenya's food security by encouraging the development of the ILV research field. This fits well with the Newton Fund objective that by 2021 "*Improved innovation practises will have fostered the adoption of the most effective techniques in the agriculture and energy sectors*".⁷⁹ The collaboration has a strong emphasis on human resource development and potential for long-term impact on increased food security (and relatedly, poverty alleviation, economic development and health improvement).

Origins and quality of the collaboration

The collaboration was initiated specifically to respond to the Newton-Utafiti call and was considered strong and supportive by both sides.

The UK and Kenyan PIs were introduced by colleagues at their respective institutions who had previously collaborated on a grant submission. Neither the UK nor Kenyan PIs had been considering a workshop of this nature before the call. Instead, the idea for the workshop and the UK collaboration was developed in light of the call requirements.

The idea for the workshop was subsequently developed with the team at Harper Adams (Dr Jim Monaghan and Professor Louise Manning). The workshop was targeted at ECRs as per the call requirements, although the Kenyan PI felt that the focus on ECRs would also benefit the wider ILV research field by encouraging young researchers to work and publish on this topic.

The collaboration was described as supportive and welcoming by both Kenyan and UK interviewees. There were some delays in receiving the allotted funding from the Kenyan Delivery Partner (NRF). However, other than this, no challenges relating to the collaboration or implementation of the workshop were reported.

The workshop itself was appreciated by interviewees, some of whom described it as 'excellent' and 'superb'. The participatory approach and multidisciplinary nature of the workshop were highlighted by attendees, as were practical elements (such as the visit to a local agricultural show).

One interviewee noted it is always important in activities of this nature to be aware of implicit power relations between northern and southern participants that may influence workshop dynamics (e.g. UK attendees dominating proceedings). However, the interviewee felt that this had not been a prominent issue at this event.

Additionality

Interviewees said this collaboration would not have happened without Newton Fund support, indicating strong additionality for the project. The funding call itself was the catalyst for the PIs to contact each other and provided the basis for the workshop to take place – without this the

⁷⁹ Newton Fund Kenya country strategy (internal document).

project would not have gone ahead. Connections between the UK and Kenyan participants have subsequently led to a successful follow-on Biotechnology and Biological Sciences Research Council-funded project (BBSRC), which would not have materialised without the workshop.

Interviewees also felt that the workshop encouraged a greater awareness of ILVs as a foodstuff, which would not have happened otherwise. For example, one workshop attendee who researches supply chains and agribusiness within Kenya noted that ILVs as a foodstuff were far less prominent in research and the media than commodities such as maize and sugar. However, since the workshop, the attendee has integrated ILVs into their own teaching curriculum.

4.2 Effectiveness of Newton Fund activities

Capacity building for Kenyan individuals and institutions

The workshop helped build the capacity, skills and profile of the Kenyan PI and the participating Kenyan ECRs, and provide benefits for DeKUT:

- In the case of the PI, the project strengthened his CV, helped him develop his research network, built his knowledge in the ILV research field, and facilitated an ongoing collaboration with the UK researchers. As the workshop was the first major grant he had secured, it has also laid the way for future funding. The Kenyan PI subsequently secured further funding from the NRF to conduct research on ILVs.
- The Kenyan ECRs also benefitted from knowledge and contacts through the workshop. As one noted, the project was particularly valuable as Kenyan ECRs do not often get the opportunity to travel to international conferences.
- In addition, the collaboration was seen as a benefit for DeKUT as an institution. The Kenyan PI suggested that the workshop helped put DeKUT 'on the map' and would support the development of a research centre dedicated to ILVs, which he hopes will attract international funding.

Capacity building for UK researchers and institutions

The workshop was considered to have benefitted for Harper Adams University, strengthening its track record of international collaborations and boosting the knowledge of staff members working on the project (e.g. the UK PI). It also benefitted the UK ECR participants. One UK attendee noted that they improved their ability to support students from sub-Saharan Africa as well as their understanding of the Kenyan country context.

New international partnerships

Both the UK and Kenyan PIs indicated that they would be interested in future collaborations or exchanges if funding were available (although they are not actively seeking funding). For UK counterparts, DeKUT would be their first choice of collaborator for future similar opportunities. The Kenyan PI is currently collaborating on a book chapter with one of the senior UK attendees.

A number of international grant applications were launched by UK and Kenyan researchers who met at the workshop, some of which had been successful in securing funding. This includes a BBSRC project between collaborators at the University of Reading and Kenyan institutions,

focusing on topics identified as a research priority during the workshop. Researchers associated with the Royal Botanic Gardens (Kew) have also engaged with participants they met at the workshop during later visits to Kenya.

A research network was launched on LinkedIn following the workshop to maintain connections between participants. However, this has not been active as a network, which one interviewee attributed to the lack of funding opportunities to act upon the connections. This was echoed by one attendee who noted that, despite discussing potential collaborations with UK researchers at the workshop, communication had dwindled.

Additional or unexpected benefits

While the workshop's primary purpose as a People Pillar activity was to develop researcher capacity, interviewees also cited the learning from the workshop as a key benefit. One attendee noted that they had shared learning on ILVs with their own students and integrated ILVs as a topic into a new international research project they were undertaking. A different attendee noted being surprised to learn that plants they had previously considered weeds were actually edible and had helped a relative apply this learning to their own business.

4.3 Emerging signs of impact

One interviewee emphasised that research into plant production and genetics usually has a significant lag between production and impact. These project's potential to impact on Kenya's food security and economic development in the long term will depend on the quality of research and policy outputs resulting from connections developed during the workshop. However, subsequent grant applications by participants provide an indication that the project has helped to sustain further research on ILVs, which may contribute to impact over the longer term.

Signs of sustainability

Workshop attendees perceived the workshop to be of high value, both in terms of personal benefit as researchers and the learning and networks generated. However, a number of interviewees also raised concerns over the sustainability of the benefits as a result of a lack of follow-on funding.

While interviewees praised the excitement and ideas that the workshop had generated, the lack of provision for follow-on connections meant that, unless participants were successful in securing a grant, there was no formal mechanism by which connections and collaboration could continue past the life of the workshop. As one interviewee noted:

"I found a lot of relevance to the situation in Kenya. The only problem is... the [workshop] just ended there. Five days of highly charged, very intelligent young people... but on Friday you go home. So what the [workshop] addressed was what it was meant to do, which was to create networks for younger researchers... but in terms of advancing research, there wasn't much of an avenue."

One interviewee noted that there were not necessarily suitable grants available for follow-on research collaborations. Another noted that such larger grants (such as the GCRF) are highly competitive and have a low success rate: *"It's difficult to find that particular source of funding... the scale-up between the type of research and activities funded by the Newton Fund and the next level is huge. And there's nothing in-between, no milestone or mid-way grant."* In addition,

one interviewee noted that it was difficult in general for Kenyan researchers to come to the UK for follow-up activities.

Complementarity and coordination

The workshop's multidisciplinary nature meant that a number of areas relevant to economic development were explored. For example, one attendee noted that key findings from the workshop related to improving the perception of ILVs as a 'poor man's food' by adding value to create higher-value products. The need for better market brokerage was also suggested, with one potential output discussed being a website to better connect actors in the market chain (suppliers, researchers, government), although this had not been progressed at the time of writing.

In addition, the workshop was also attended by policy researchers. One attendee also noted the value of workshops, such as this, to inform policymakers' thinking in 'softer' ways by developing people's knowledge and mindsets, rather than simply delivering a report.

4.4 Conclusions

- **The collaboration was seen as supportive and valuable by both the UK and Kenyan participants** and enabled specific areas of UK expertise to feed into specific objectives within Kenya. Collaboration with the BEIS in-country team and the NRF were seen as supportive, although some administrative errors and delays (also reported at a wider country level) posed a challenge during implementation.
- **The workshop was seen to support the building of connections and skills among ECRs** and support the furthering of the ILV research field within Kenya. Hosting the workshop in Kenya and involving participants from across the agricultural, genetics and supply chain fields meant that the workshop was a valuable way of exploring local solutions to a specific, under-researched area. The topic itself was selected through a successful prioritisation process which ensured that it was well-situated within Kenya's research and development priorities.
- Despite this, there are challenges to building on this learning **due to a lack of formal means to continue connections after the workshop**. While some successful collaborations have been launched from connections made at the workshop, others have not progressed in light of other competing pressures or lack of opportunity for further exchanges. This may hinder the extent to which learning from and connections made during the workshop can translate into policy-relevant research outputs and impact in the ILV field.

Lessons learned and points to consider going forward

- When hosting workshops, **it is important to be conscious of implicit power relations or hierarchies** between Kenyan and UK researchers that may affect the workshop's conduct (for example, how speaking time is distributed or how the seniority of researchers is assumed). However, this was not considered to be an issue in the workshop at hand. Formal means of monitoring this, such as asking PIs to report on how they ensured equal leadership in practice in post-workshop reports, could be considered.
- Despite clear excitement about the workshop's ideas, some interviewees felt the **lack of formal mechanisms to collaborate further**, particularly for Kenyan researchers, may present a challenge to long-term impact. It may be useful to consider additional ways to build

follow-on work into the workshop design. Suggestions made by interviewees include mandating certain outputs or sustainability plans as part of workshop funding agreements, building in links to other collaboration and exchange grant programmes, and splitting workshop activities into a two-stage process to encourage contacts over a longer period.

- Attendees valued the workshop's exploratory nature and were eager to emphasise the value of these kinds of activities despite a lack of 'hard' research outputs. **Follow-up surveys or other forms of monitoring may help identify some of these medium- and long-term benefits** and additional learning to help shape the design and selection of workshops.
- The selection process, which involved a peer review panel from Kenya, **was highlighted as a successful way of ensuring co-ownership**, leading to the workshops selected under this call being relevant to Kenyan priorities. The programme could review the process to see whether lessons from the Kenyan experience of local prioritisation could be considered for other Researcher Links countries or shared more widely.

5 Project: Household air pollution and risk of oesophageal cancer: a case-control study in Western Kenya

Summary

Project title	Household air pollution and risk of oesophageal cancer: a case-control study in Western Kenya (HAP ESCAPE)
Call title	UK-Kenya Joint Partnership on Non-Communicable Diseases
Short description	The study will explore the role of household air pollution as a risk factor for oesophageal cancer in Kenya.
Objective(s)	<p>This partnership between Moi University and the University of Liverpool aims to build on earlier research on the contributing factors to oesophageal cancer prevalence in Kenya by exploring the role of household air pollution from biomass cooking stoves.</p> <p>The main outputs are a detailed analysis of household air pollution as a cancer risk and an accompanying report on strategies for preventing oesophageal cancer in Kenya.</p>
Pillar	Research
Acton value (total budget allocated in country, in GBP)	<p>UK: £ 377,139</p> <p>KE: £ 152,909</p>
Start/end date (Status: on-going or complete)	January 2019 to December 2021 (ongoing)
DP UK and overseas	Medical Research Council – National Research Fund

Award holders/ grantees	Moi University; Institute of Psychology Health & Society, University of Liverpool; International Agency for Research on Cancer (IARC)
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Description of the project

The UK – Kenya Joint Partnership on Non-Communicable Diseases call is a **Research Pillar initiative** to fund research on non-communicable diseases (NCDs) of relevance to Kenya. NCDs are diseases that are not transmitted between humans, such as cancer, diabetes, asthma, and cardiovascular diseases.

Oesophageal cancer is the third most common cause of cancer death in Kenya for both women and men and is common in many East African countries, despite being a rare form of cancer in West Africa.⁸⁰ Despite a high mortality rate and a high proportion of patients being from younger age groups, risk factors for this cancer remain understudied, resulting in limited scope for prevention strategies for disease risk mitigation and detection.

A 2014 study by the Kenyan award holder aimed to study lifestyle, environmental and genetic risk factors for oesophageal cancer in Kenya. The study compared characteristics of newly diagnosed oesophageal cancer patients at the Moi Teaching and Referral Hospital to other hospital patients and visitors without the disease. Blood and tumour samples were also subject to genetic analysis. Early results from the study found that alcohol and tobacco were contributing factors among older male patients. However, this was not the case for women or younger patients. This study was undertaken as one of a series of case-control studies in East Africa of oesophageal cancer (Oesophageal Squamous Cell Carcinoma African Prevention Effort, ESCCAPE) led by the International Agency for Research on Cancer (IARC), an agency of the World Health Organization (WHO) based in Lyon, France.

This partnership between Moi University and the NIHR CLEAN-Air (Africa) Global Health Research Group at the University of Liverpool aims to build on this earlier research by exploring the role of household air pollution (HAP) from biomass cooking stoves as a contributing factor to oesophageal cancer among women and younger people. IARC (as a French organisation) was not eligible to receive funding from the Newton-Utafiti grant but is collaborating on the project in an advisory role.

Specifically, the study (titled HAP ESCCAPE) aims to expand upon the earlier 2014 study by including household air pollution as a variable based on monitoring participants who are female and/ or aged below 40, and a questionnaire to assess exposure to HAP over the participant's lifetime.

Pathway to impact

As shown in Annex 4, Figure 5, this collaboration fits the Newton Fund Theory of Change, falling within Research Pillar activities.

Inputs: Newton-Utafiti funding worth £530,000 was used to fund the study research activity, including fieldwork activities, staff time and travel and dissemination costs.

⁸⁰ Project summary – UKRI data (provided in confidence)

Activities: The study recruits oesophageal cancer patients receiving treatment at Moi University, in addition to a control group of other patients. 50 treatment and 50 control participants are visited at their home where the research team takes air quality measurements. Participants subsequently wear a personal monitor for 24 hours to measure exposure over a day. The Liverpool team also carried out networking activities with the academic institutions responsible for the other ESCCAPE studies implemented in East Africa.⁸¹

Expected Outputs: The collaboration will generate i) a detailed analysis of household air pollution as a cancer risk, ii) findings relevant to the prevention of oesophageal cancer in Kenya, where 87% of households rely on solid-fuel cooking stoves, and iii) if strong associations between HAP and oesophageal cancer are found, the integration of findings into predictive risk models for the identification of individuals at high risk.⁸² The study was in progress at the time of writing and has not yet reported its findings.

Expected Outcomes: Through improved understanding of contributing factors to oesophageal cancer, Kenyan policy and health decision-makers will be able to better plan and implement targeted interventions to reduce the prevalence of oesophageal cancer. The study team estimate that a 25% reduction in oesophageal cancer in Kenya by 2030 could result in 2000 fewer cases each year, a large number of which would result in otherwise avoidable death.⁸³ The data collection tools developed for the project may also be useful for further research in this field and relevant for other East African countries.

Expected Impact: Improved capacity to predict and mitigate the risk of oesophageal cancer, and improved understanding of the health risks of household air pollution, will help protect lives and reduce health spend on the treatment of oesophageal cancer. A secondary impact may be an additional incentive to develop strategies to reduce global reliance on solid-fuel stoves in favour of clean-energy alternatives.

5.1 Emerging project results

Relevance of Newton Fund activities

Relevance of the collaboration to Kenya's socio-economic priorities

This project is of clear relevance to Kenya's own Vision 2030 priorities and the Big Four agenda item on access to affordable healthcare. It also fits with a government strategy to tackle non-communicable diseases. Interviewees noted that although much internationally funded research in the sub-Saharan Africa region focuses on infectious diseases, NCDs are a significant health issue in Kenya and are a particular priority of the NRF.

80% of Kenyan households are estimated to use solid cooking fuels (including wood and charcoal).⁸⁴ In addition to the hypothesised oesophageal cancer risk, HAP has also been linked to a range of other NCDs, including other forms of cancer and respiratory and cardiovascular conditions. In addition, the collaboration has the potential to feed into wider discussions about the use of alternatives to solid-fuel cooking stoves as an energy source, which has wider

⁸¹ Project summary – UKRI data (provided in confidence)

⁸² UKRI (n.d.). 'Household air pollution and risk of oesophageal cancer: a case-control study in Western Kenya'. Available at: <https://gtr.ukri.org/projects?ref=MR%2FS009051%2F1>

⁸³ UKRI (n.d.) op. cit.

⁸⁴ Clean Cooking Alliance (n.d.). 'Kenya'. Available at: <https://www.cleancookingalliance.org/country-profiles/focus-countries/4-kenya.html>

implications for green energy and associated poverty reduction strategies in the region. Both topics are of clear relevance to ODA priorities.

Origins and quality of the collaboration

This study is an extension of the earlier ESCCAPE studies in Malawi, Tanzania, and Kenya. The Kenyan and UK PIs had previously worked together on the link between HAP and NCDs. The Kenyan PI was then approached by the IARC which had identified the Newton Fund call. While the Kenyan and UK PIs had not been actively developing a collaboration in this area, they felt the nature of the call perfectly suited their research areas and experience, both in terms of the earlier ESCCAPE studies and the work of the CLEAN-Air group.

Both the Kenyan and UK teams considered the collaboration strong, and no challenges were reported in working together. Good personal relationships and the experience of the Kenyan PI in the subject area were key enablers for strong collaboration.

Additionality

The project might have secured funding from other sources, including other MRC calls. However, interviewees said that the joint funding approach embodied in the Newton Fund allowed a genuine partnership – with other funding sources the UK team would probably have taken a stronger lead role. The project is therefore assessed as having moderate levels of additionality.

5.2 Effectiveness of Newton Fund activities

At the time of writing, the pandemic has halted the project's community-based research. However, it is expected that the research will recommence when possible and that ultimately the project will deliver its objectives.

Quantitative analysis based on the earlier ESCCAPE study datasets was presented by the project team at the virtual International Society for Environmental Epidemiology (ISEE) Conference in Washington in August 2020, and a publication of initial findings is currently in development. The team also participated in a two-day meeting in Malawi in February 2019, which brought together all ESCCAPE study teams, where they presented the progress of HAP ESCCAPE.

Benefits for institutions and researchers

Researchers on both sides of the collaboration expect the collaboration to benefit careers and generate high-quality and relevant research. One interviewee noted that developing the evidence base would be of wider benefit to the UK. For example, some areas of London have significant air pollution from wood-burning stoves.

One interviewee noted that a wider benefit for the UK was the partnership's collaborative nature. In particular collaborations of this nature are important in building awareness among UK and Western researchers of the need to take account of local contexts and settings in planning and interpreting study data collection.

In addition, as part of the collaboration, the study team organised training for the Kenyan data collection team on the top-of-the-range air pollution monitoring equipment.

New international partnerships and opportunities for the UK

The researchers hope that the study will lead to new international partnerships. The project coordinator is planning for a follow-on grant application under which the Kenyan PI and IARC will analyse additional data collected by the project (including water and soil samples) not covered by the current grant.

The CLEAN-Air Africa team at the University of Liverpool is currently working on a bid to expand the research group into a new NIHR research unit, which would include further collaboration with the Kenyan PI.

The MRC also considered that they had benefitted from the partnership and said the call had helped them to develop links “at every level” and develop a nationally-relevant research partnership, resulting in a better understanding of the local context and how to deliver effective research in the region.

Additional or unexpected benefits

For this study, the team developed a questionnaire to gauge exposure to household air pollution over a lifetime (for example, by enquiring about respondents’ childhood exposure). This is considered a fairly unusual tool in the current field, and it may benefit future research teams who can use the tool and study fieldwork protocols in related research.

5.3 Emerging signs of impact

Potential impact on poverty reduction and economic development

When complete, the study is expected to have a positive impact on health outcomes within Kenya, with secondary benefits for economic development as a consequence of improved population health. In addition, the study is expected to have wider benefits by generating evidence on the link between HAP and oesophageal cancer, which will be of particular value to other countries globally, which also have a high reliance on solid-fuel cooking stoves. It is highly relevant to SDG 7 on Affordable and Clean Energy.

Signs of sustainability

The study is expected to lead to academic publications, which will ensure research findings are available for reference over the long-term. The follow-on bids currently in preparation are a further indication of the project’s sustainability.

Complementarity and coordination

The project's contribution to policy changes in this field will ultimately depend on the integration of study findings into health policy planning. The intention is that the outputs will provide policymakers in Kenya (and other countries where solid-fuel cooking stoves are prevalent) to better plan and implement interventions to reduce the prevalence of oesophageal cancer.

The project will also develop policy briefs for the government to present findings clearly using simple language. The Kenyan PI has existing relationships with health policymakers. In addition, the CLEAN-Air Africa group has experience developing policy briefs and materials for policymakers and will share the findings from HAP ESCCAPE events in other countries in sub-Saharan Africa.

In addition, the partnership with IARC, as the leading body in this field, means that there is a strong likelihood that findings will be communicated widely to policy and health decision-makers.

5.4 Conclusions

- **The collaboration has been mutually supportive, relevant, and productive** and is expected to produce clear findings on the role of household air pollution in cancer risk which are relevant to Kenya and other countries. The existing relationships of both the Kenyan and UK PIs with policy and research communities, and the involvement of IARC, means there is a likelihood of wide and effective dissemination within Kenya and elsewhere.
- **The project expects to add value above its findings by drawing on synergies with other research** activities. In addition, the UK research group expects to be able to use an NIHR research group to disseminate findings and build the evidence base on HAP and NCDs.
- The fact both Kenyan and UK partners contributed funds was a key factor in enabling a **strong and equal partnership**. This allowed the Kenyan PI to take the lead where alternative funding sources might not have done.
- While the project has been considerably affected by COVID-19, there are clear plans to resume work once conditions allow this. This highlights the fact this is a **well-organised project with strong commitment on both sides**.

6 Project: Leaders in Innovation Fellowships Programme 4

Summary

Project title	
LIF Programme 4	
Call title	Leaders in Innovation Fellowships programme
Short description	The Leaders in Innovation Fellowships programme (LIF), funded by the UK Royal Academy of Engineering and KENIA, is a leadership development programme for entrepreneurs from Newton Fund countries supporting the commercialisation of research. LIF participants attend a two-week residential workshop in the UK and then receive follow-up coaching and support for a further six months. The fourth cohort of the LIF programme (LIF4) was implemented from 2017 to 2018, with 14 fellows from Kenya.
Objective(s)	<p>The programme's primary aim is to support fellows to commercialise innovations that address social and economic challenges in their country.</p> <p>A secondary aim is to develop an understanding of entrepreneurship among the research community. The programme also aims to also create international networks and a global LIF alumni community to provide continuing peer support to fellows.</p>
Pillar	Translation
Action value (total budget allocated in country, in GBP)	UK: £150,000 (FY 18/19 Annual Budget for LIF4 programme in Kenya)
Start/end date (Status: on-going or complete)	In Kenya: 2017 to 2018 (with subsequent cohorts to present day)
DP UK and overseas	Royal Academy of Engineering (UK); Kenya National Innovation Agency (KENIA).

	Delivery of parts of the programme were contracted out to expert providers such as Oxentia Ltd. and the SOURCE Institute, both UK organisations.
Award holders/ grantees	LIF4 had 14 fellows from Kenya.

Description of the project

LIF4 involved 200 fellows from 15 Newton Fund countries, including 14 fellows from Kenya. Fellows are researchers who are potentially in a position to commercialise their research. Kenyan fellows participated in a residential programme in London in February 2018 alongside fellows from South Africa and Turkey.

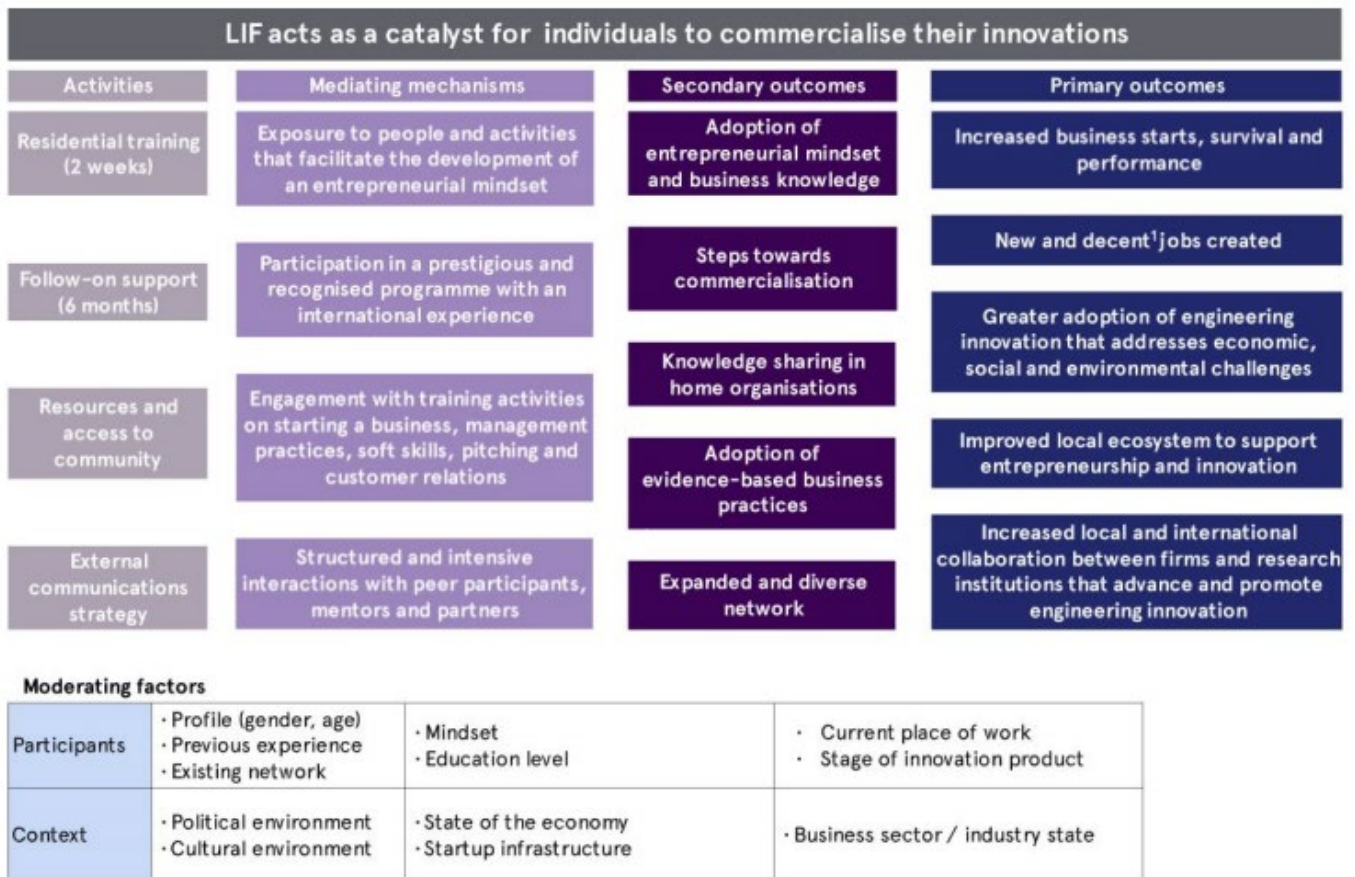
Fellows attend a two-week residential workshop in the UK, which provides training and coaching to develop business plans and pitch materials. They subsequently receive support and coaching from LIF staff for a further six months, including remote support and in-country events delivered by local LIF-affiliated coaches.

Kenyan fellows from the LIF4 cohort had projects in the following sectors: i) manufacturing and design (six projects), ii) computing and communications (five projects), iii) chemical and processing (four projects), iv) electrical and electronic (two projects), v) energy and power (two projects); vi) transport and mechanical (one project), and vii) medical and bioengineering (one project). Kenyan innovations included products as diverse as a soil analysis testing kit, solar powered cold storage units, an avocado oil extractor, and a compost aerating tool (also see Box 1 below).

Pathway to impact

As shown in Annex 4 Figure 6, this collaboration fits well with the Theory of Change for Newton Fund Translation Pillar activities. It aims to establish research and commercialisation bridges, promote exchange of expertise, and develop new industry-academia or business-business partnerships. It also contributes to some People Pillar objectives (namely professional development through applied research and commercialisation training).

Figure 3: LIF Logic Model



Source: Royal Academy of Engineering

In terms of **inputs**, £150,000 of funding was provided for LIF 4.

The project’s **activities** comprised a two-week residential programme in the UK for fellows, six months of remote support by mentors, and a seed funding grant to support product development. The UK residential programme covered business modelling, negotiation, finance, training, operations, leadership and finance, intellectual property (IP), and regulation. Fellows were also given one to one coaching on their business and commercialisation plans and participated in a day of peer learning.

This programme was followed by six months of remote support tailored to participants’ specific needs (July to December 2018) and a two day in-country networking and coaching event (9 to 10 October 2018) attended by 30 participants.

Following the programme, Kenyan innovators were given a pre-commercialisation grant of up to five million Kenyan Shillings (approximately £35,000) to develop their innovations. During the follow-up programme, fellows were also given further support covering market research, IP advice, support in identifying partners and collaborators, and advice on valuation, licensing, regulations/certification and sources of further funding.⁸⁵

LIF alumni also have access to an online platform for fellows and programme staff and mentors, which offers resources, webinars, remote training and events.⁸⁶

⁸⁵ Oxentia LIF4 annual evaluation report.

⁸⁶ Royal Academy of Engineering (n.d.). ‘About the LIF Programme’. Available at:

<https://www.raeng.org.uk/global/sustainable-development/leaders-innovation-fellowships/about-lif-programme>

The project's expected **outputs** include the residential programme, training events, workshops and grants as described above.

The project's expected **outcomes**⁸⁷ are:

- increased business starts, survival and performance.
- new and decent jobs created.
- greater adoption of engineering innovation that addresses economic, social and environmental challenges.
- an improved local ecosystem to support entrepreneurship and innovation.
- increased local and international collaboration between firms and research institutions that advance and promote engineering innovation.

6.1 Emerging project results

Relevance of Newton Fund activities

Relevance of the collaboration to Kenya's socio-economic priorities

The involvement of KENIA in shortlisting and evaluating LIF applicants indicates that Kenyan stakeholders had a clear say in which interventions should be funded. KENIA is also involved in setting thematic areas for the LIF innovations and decided on the inclusion of seed grant funding for LIF participants in Kenya. The results of this process ensured the selection of a wide range of fellows with innovations linked to Kenya's Big Four priorities.

Three LIF innovations are summarised in Box 1.

Box 1: LIF innovations included in case study research

Upesy

Upesy is an emergency services app first developed in 2016 after the founder, was robbed in the street and decided to create an app to better link citizens with emergency services. The app was developed between 2016 and 2018 and has been accruing users since then. It has two service tiers:

- a free tier, through which users can report incidents directly to the local police (including geolocation), raise an emergency alert with predefined contacts, and request that contacts track their location.
- a paid-for tier, through which app users can send emergency alerts to local private health, security and emergency service providers, for a monthly subscription starting at 1,299 Kenyan shillings a month (approximately £9).

The app works through a revenue-sharing model with Upesy taking a cut of fees paid to the private emergency service providers. The app currently claims 5,000 users in Nairobi, Kisumu and Mombasa. The founders are also exploring partnerships to expand to Uganda, Nigeria and South Africa.

⁸⁷ Referred to in the LIF logic model as 'primary outcomes'.

After the founder participated in the LIF programme, Upesy completed a pilot with the Kenya National Police Service to use app data for case management. It is currently in talks with Nairobi county authorities to enable direct contact with the fire department. The founder has also been shortlisted for the Newton Prize competition for additional funding to extend the app to cover areas of gender-based violence.

Hip spica table

The hip spica table is a medical device be used in a hospital to hold a child with thigh and hip fractures in position during treatment. The machine helps to align the bone, allowing the hip spica cast to be applied. The table was designed by an orthopaedic technician who had worked in Kenyatta National Hospital (the largest in East Africa) for 18 years.

The technician (and later LIF participant) knew there were problems with existing methods and tools for making casts, resulting in many patients being re-admitted because of poor bone alignment (which can result in deformity and disability in children). In addition, four to five staff were required to apply the cast. He therefore developed a specialised hip spica table resulting in better treatment for children, reducing re-admissions, lowering the cost of treatment, reducing deformities and referrals by smaller regional hospitals to Kenyatta National Hospital. The table also reduces the number of personnel required to two.

The hip spica table was awarded first place during the final pitch presentation at the LIF training programme. LIF coaches also helped set up an online crowd funder, paying for five tables to be produced and donated to local hospitals. After participating in the LIF programme, the fellow set up the Zakam Orthopaedic Innovation Company, to produce the hip spica table and other medical-related products. The company's long-term goal is to expand to hospitals in and outside Kenya and encourage local manufacturing of these tools.

Auto Truck

Auto Truck is a company set up to develop electric motor handcarts to replace the use of manual handcarts in Kenya's cities (and more recently to build and sell electric tuk-tuks). The founder developed the product to improve conditions for manual workers using handcarts and encourage local manufacturing and green energy alternatives to fuel-based tuk-tuks.

The seed funding provided by the LIF programme was used to develop vehicle prototypes, and the company has expanded to become a joint venture with the National Youth Service, where the founder is employed. At the time of writing, the company is in the late product development stage and hopes to market the product shortly. The handcart innovation was also shortlisted for the 2019 Africa Prize for Engineering Innovation run by the Royal Academy of Engineering.

ODA relevance

This collaboration aims to stimulate economic development in Kenya by nurturing the development of domestic innovations and entrepreneurs and, through their innovations, contribute to a range of wider social and development goals. All innovations reviewed for this report have objectives clearly linked to Kenya's development goals and are also relevant to ODA priorities. In many cases, innovations have multiple goals. For example, the hip spica table is a device to improve health outcomes but is also supporting local manufacturing and employment. Similarly, Upesy's founder is seeking to extend app's functionality to address gender-based violence.

The LIF scheme aligns closely with SDG 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) and SDG 9 (Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation). However, businesses the programme supports are also expected to contribute to all 17 SDGs.

Origins and quality of the collaboration

This was the first programme that KENIA undertook with UK partners, and the LIF4 collaboration was considered a success. The programme was also considered to be well-structured, with feedback and improvement mechanisms built into the structure of subsequent phases.

Interviewees reported being attracted to the LIF programme for different reasons. One innovator indicated that the primary attraction of the programme was the seed funding to develop a prototype. In contrast, another indicated that it was mentorship as he struggled with the business aspects of his innovation. The only challenge reported by a fellow was in relation to delays in receiving Kenyan government funding.

An unexpected challenge arose when nearly all fellows in one LIF cohort were refused visas at first. One interviewee attributed this to a mix of incorrect and late applications by some fellows and refusals for other reasons by the UK visa authorities at the high commission in Nairobi (who operate independently of the Newton Fund delivery team). As a result, some fellows were unable to attend the UK workshop and instead participated in an alternative workshop in Kenya. As a result of this experience, the visa process was started earlier for the following cohort, and this issue did not arise again.

6.2 Effectiveness of Newton Fund activities

Capacity building results

There is good evidence the LIF programme developed the capacities of individual LIF participants. LIF participants highly valued the learning and opportunities from the workshop and ongoing mentoring, noting that it had provided them with business and commercial skills, which were critical in developing their innovations. Several stayed in touch with their mentors even after the end of the formal mentoring relationship. It is notable that some Kenyan LIF participants have gone to apply to the Royal Academy of Engineering's Africa Prize for Engineering Innovation⁸⁸ and have featured in Newton Prize shortlists.

LIF participants from all countries rated themselves as more confident and skilled at business planning, presenting to investors, understanding their financial and intellectual property positions, and leadership and operations after taking part in the residential programme.⁸⁹ In the post-programme LIF4 survey, conducted after the follow-up support programme, 86% of respondents said that LIF had been 'very important' to their personal development as entrepreneurs and 13% said it had been 'quite important'⁹⁰.

There is also evidence the LIF programme helped to develop networks between fellows and alumni. For instance, all 118 LIF4 post-programme survey respondents indicated that they were still in touch with other LIF alumni. One innovator interviewed for this report noted that he

⁸⁸ See Royal Academy of Engineering 'The Africa Prize for Engineering Innovation' Available at: <https://www.raeng.org.uk/global/sustainable-development/africa-prize>

⁸⁹ Oxentia LIF4 annual evaluation report

⁹⁰ Oxentia LIF4 annual evaluation report

remained in touch with an innovator from South Africa from his cohort, with whom he was seeking to collaborate to expand his product into the South African market.

Translation of research into collaborative solutions to address development challenges

The programme was intended to encourage the development and commercialisation of innovative solutions to development challenges, and social impact was included as a selection criterion by the Royal Academy of Engineering. However, the programme within Kenya focused less on academic research than other LIF countries, with many of the ideas generated by independent entrepreneurs or those working in industry.

75% of respondents to the post-programme LIF4 survey (including LIF countries other than Kenya) indicated that they considered that their LIF innovation has had a positive social or economic impact on their country or in developing countries more broadly.

New international partnerships and opportunities for the UK

Interviewees felt that the UK has benefited from the partnership by developing relationships with individuals who may go on to be leaders in business and services, and by positioning the UK as a partner for future relationships and advice on engineering and innovation. In addition, the development of a network of Kenyan innovators may facilitate future links with UK entrepreneurs and universities.

UK partners noted that, as they had not worked with organisations in Kenya before, the programme had been beneficial in terms of building their links and relationships within the country, promoting the likelihood of future collaboration. It is notable that a survey of previous LIF alumni (from LIF 1 to 3, which did not include Kenya) found that of 25 out of 139 respondents reported creating new partnerships with individuals or organisations in the UK, including universities, companies, suppliers and distribution partners, UK investors and mentors, and other organisations such as NERC and the UK catapult technology centres⁹¹.

Additionality

The available evidence suggests the project had a high degree of additionality. For instance, participants interviewed for this case study said the outcomes they witnessed would not have been possible without the fellowship. The additional project funding to LIF4 fellows provided by KENIA during the follow-on support period was also valuable by participants, with interviewees saying this level of financial support that would not have been available elsewhere. One interviewee noted that while there was lots of interest in the Kenyan innovation ecosystem, many current grant schemes provide smaller amounts of funding. Two others said as local seed funders usually require companies to be at a more advanced stage (with better evidence of profitability) before taking an interest.

The capacity-building elements of the LIF programme also clearly added value. One interviewee noted that while some innovation hubs provide training, most are primarily co-working spaces that do not offer the developmental benefits of LIF. The innovators interviewed for this study said the programme had provided them with the necessary skills to develop their businesses (and therefore better placed them to attract further investment) which they would not have otherwise had. One fellow noted that he did not feel he would have received subsequent investment without these skills. Another noted that he had not been considering commercialising (and thus expanding the use of) his innovation before taking part in the programme.

⁹¹ Oxentia LIF4 annual evaluation report.

6.3 Emerging signs of impact

Potential impact on poverty reduction and economic development

While most impacts from commercialisation of innovations supported by the LIF programme will only emerge with time, there are good indications that some of the innovations supported through LIF4 are already bringing wider benefits. For instance, products based on all three of the innovations described in Box 1 are currently available in the marketplace and being used, and therefore already contributing to poverty reduction and other development goals. For example, the hip spica table is likely to improve health outcomes, the Upesy app to improve access to services for personal security, and Auto Truck to provide greener forms of transport for people and products.

By the end of the of LIF4, Kenyan fellows who responded to the final survey had raised a total of £330,000 in additional funding.⁹² One interviewee noted that at least one LIF4 project has been commercialised outside Kenya. In terms of commercialisation strategies, although data is not disaggregated by country, across the LIF4 cohort 34% of fellows decided to set up a spin-off or start-up company, 22% chose to license their product, 6% decided on a joint venture, 4% chose another avenue, and 34% were still deciding at the end of the support period.⁹³ The internal evaluation report noted that many projects shifted from idea to commercial production during the programme.

Signs of sustainability

The programme aims to encourage the development and commercialisation of innovations that contribute to social outcomes. In this regard, successful innovations are expected to be sustainable by default. One interviewee also noted that the inclusion of the seed funding grants was designed specifically to encourage the programme's sustainability by ensuring that innovators had the necessary funding to continue on their commercialisation journey. In addition, the design of the programme, which includes follow-up mentoring over the subsequent sixth-month period, is designed to encourage continued commitment to the commercialisation process.

Complementarity and coordination

The programme was targeted at innovators, and therefore was not explicitly aiming to influence policy within Kenya. Despite this, some of the innovations may lead to additional impacts in the policy sphere. For example, the Upesy app founder was undertaking trials with police and fire services at the time of writing to improve service delivery by better connecting citizens to services.

However, there are ways in which future iterations of the programme could be better coordinated with other initiatives to increase impact. For instance, both coaches and participants recommended extended follow-up coaching or mechanisms with in-country partner agencies to fund long-term mentoring for LIF.⁹⁴ It was also suggested that the programme could communicate funding schemes able to provide longer-term funding for commercialisation activities after the end of LIF support. A specific recommendation for the in-country events was to spend more time discussing the local ecosystem and specific challenges relating to the local context and meeting local industry stakeholders. This would require developing materials in collaboration with in-country partners or local experts and would increase direct relevance to the Kenyan context.

⁹² Oxentia LIF4 annual evaluation report.

⁹³ Oxentia LIF4 annual evaluation report.

⁹⁴ Oxentia LIF4 annual evaluation report.

6.4 Conclusions

- **Fellows and Delivery Partners greatly appreciate the LIF programme.** Kenyan innovators from technical backgrounds felt that it had given them valuable business skills and would not have reached their current product development stage without the training and seed funding it provided. The two-stage selection process was designed to get both UK and Kenyan perspective on the viability of innovations, including relevance to KENIA's priorities.
- It is too early to assess the overall socioeconomic impact of the cohorts in Kenya, as many of the innovations have still not reached the market. However, evidence from annual evaluations and interviews provide promising **signs that the programme has met or is on track to meet its objectives in Kenya.** This includes examples of a number of projects having secured private investment and reached the market.

Lessons learned and points to consider going forward

- While projects were assessed for commercial and technical viability and potential for social impact during the selection process, no specific assessments have been undertaken of the extent to which projects are providing positive social impact in practice. **The programme could consider monitoring the social outcomes of innovations more systematically to understand the medium- and long-term social impact** and how to best facilitate the realisation of social impact.
- Fellows said that the programme's grants provided valuable early-stage funding that would not otherwise be available from private venture capital sources, who would be hesitant to take on this risk. The Newton-Utafiti Fund could **consider reviewing whether there are activities it could support, which could tackle these wider barriers to innovation in the Kenyan innovation ecosystem.**
- Academic and research institutions' participation in the LIF programme has been more limited among Kenyan cohorts than other LIF countries. While this may be a reflection of the priorities of KENIA as an institution, as well as the wider Kenyan innovation ecosystem, it may also reduce opportunities for wider Newton Fund objectives, such as institutional strengthening and developing links between academia and industry. **The programme could therefore consider ways to further strengthen links to universities and Technology Transfer Offices and more generally in Kenya.**

Annex 1 – Methodology

Research methods and data collection approach

The thematic impact studies are central to our Final Evaluation approach and involved an intensive period of remote research by the evaluation team members.

Preparation for the research included a document review of country-specific documents on the Kenya research and development context. Documents reviewed include the evaluation's Kenya Baseline and Endline Reports, Mid-Term Thematic Impact Report, and the updated Country Situation Note. We also conducted a literature review of additional documentation on Kenya's science and innovation landscape, and existing UK-Kenya collaboration activities. Project-specific documentation, such as application forms, progress, and final reports, were reviewed for each action included in the study, where provided by the Delivery Partner, local partners or researchers.

The document review was accompanied by **remote research with respondents in the Kenya and the UK** in September – October 2020. Three main categories of stakeholders were interviewed: i) in-country UK representatives and Newton Fund in-country team; ii) UK and local funders; and iii) participating researchers. In some cases, additional university staff, such as university leadership or other research teams, were also interviewed.

Our data collection was complemented by an analysis of the pathway to impact for each action, which can be found in Annex 4. Here, we analysed each project's trajectory to impact by placing it within the Newton Fund Theory of Change. This allowed us to visually represent the pathway to outputs, outcomes, and impact of each activity, and highlight its (potential) contribution to broader Newton Fund goals.

Limitations of the research approach

Case studies were limited to three projects per case study, which were conducted remotely owing to the Covid pandemic. In some projects, the added logistical challenge of remote research limited the number and range of stakeholders consulted. The volume of documentation provided varied by project, thus limiting the possibility of triangulating findings. The case study findings reflect the data provided by each project and what is available online. The case study is not representative of all Newton Fund activities. Whereas it provides valuable depth and illustration of Newton Fund activities, the case study alone does not provide generalisable evidence.

Research findings have been triangulated across different stakeholder groups and various sources of documentation (project documents and online resources such as the Research Council UK (RCUK) Gateway to Research portal). However, the research team could not independently verify statements by all the different contributing stakeholders or verify what was reported in the documentation.

Additionally, the COVID-19 pandemic resulted in the need to revisit our data collection approach, particularly in terms of our 11 country case studies. The case study research was originally scheduled to take place in three waves of partner country visits between March and August 2020. The inability to travel internationally and the closure of offices, embassies, universities, and research centres required switching to a **remote-based approach**, as agreed with BEIS in March 2020.

In revising our case study approach, we recognised that switching to a remote-based approach would have likely implications on the quality of data collected, as outlined in our April 2020 Concept Note. The quality of interviews could have been affected for several reasons, including:

- problems with connectivity, technical issues and limited telephone or internet coverage, which posed the risk of lowering the quality of calls and cause loss of rapport, creating abrupt feelings in interviews and affecting the depth and quality of our findings.
- the absence of visual or nonverbal cues, inability to observe behaviour and body language, with the risk of telephone interviews becoming mechanical and cold.
- having little opportunity to establish rapport with respondents and having potentially shorter times for interviews as respondents may more easily become fatigued by telephone compared to face-to-face interaction.
- limited engagement, low response rates and little interest in participating in our research, which might limit the breadth and depth of our findings.
- the inability to visit laboratories or facilities, and limited scope for unplanned interviews with additional staff members, researchers, or others in the same institution.
- fewer opportunities for check-ins and informal conversations with in-country teams (ICTs), who are a rich source of data.

We mitigated these issues in several ways, where:

- we included additional time for document review prior to interviews so that conversations moved on to speaking about results, emerging impact, and challenges (to take into account for shorter interview times and potentially lower quality interviews). However, it is important to consider that availability and quality of project data and information varied considerably across sampled interventions.
- we favoured video interviews wherever possible to limit the lack of nonverbal cues and to help establish rapport with respondents.
- we had several email exchanges prior to interviews to create an initial connection and rapport with participants, and to set out the objectives and areas covered in the interviews by sharing topic guides prior to our calls.
- we organised follow-up interviews wherever possible to fill any remaining information gaps brought about by having shorter interview times. We also gathered interviewee insights on additional respondents and carried out additional interviews which emerged from email exchanges and interviews.
- we organised regular check-ins with ICTs via email or telephone and delivered online presentations and validation sessions with each ICT to share emerging findings after having carried out all interviews. This allowed us to ensure we had accurately reflected the Newton Fund's experience in each country.

Annex 2 – Case Studies Sampling Overview

This Annex summarises the sampling approach used for the country case studies which inform the Final Evaluation of the Newton Fund. Detail on the approach and criteria used to develop the sample for the case studies is annexed to Tetra Tech’s Newton Fund Final Evaluation Report.

Final evaluation country sample

A total sample of 11 countries with three calls per country (totalling 33 calls) was agreed with the Department of Business, Energy, Innovation and Science (BEIS).

The countries selected for the country sample were China, Malaysia, Chile, Turkey, South Africa, Brazil, India, Philippines, Jordan, Peru and Kenya. The sample includes 3 additional countries (Jordan, Kenya and Peru)⁹⁵ due to the Newton Fund’s expanded scope. Six of these countries were included in the Mid-Term Evaluation (MTE)⁹⁶ of the Newton Fund case study research.⁹⁷

The criteria used for the country selection were:

- coverage of all regions covered by the Newton Fund.
- coverage of different levels of existing innovation and capacity of partner countries (as defined by the 2015 Global Innovation Index rankings and BEIS’ initial assessment of capacity).
- learning opportunities from new ways of working regionally in countries that either graduated from the DAC list or have ODA sensitivities; or operating in/ recovering from crises.
- the inclusion of Peru, Jordan, Kenya (countries that have not been explicitly included in the evaluation scope until now).

Non-selection of countries (or calls) does not reflect significance, quality or importance.

Proposed sample of calls and projects

Data from BEIS’ Newton Fund Activity Tracker (January 2020)⁹⁸ enabled the evaluation to determine ‘call’ activity and identify three ‘calls’ per country, giving a total of 33 calls in the sample. The following criteria were used to develop the call sample:

- ensuring coverage of all DPs.
- ensuring coverage of the three different pillars.
- reflecting emphasis on spending/thematic priorities in each country.
- allowing for longitudinal analysis by including 6 projects analysed as part of the MTE.

The outcome of the call sampling approach allowed for the identification of specific projects under each selected call. This was achieved in consultation with DPs, BEIS ODA Research and Innovation and ICTs.

⁹⁵Jordan, Kenya and Peru were not included in the MTE data collection, as they had just joined the Newton Fund. BEIS agreed to carry out in-depth case studies in the three new countries to ensure coverage of activities there.

⁹⁶ Mid-Term Evaluation of Newton Fund (2018). Accessible [here](#).

⁹⁷ These were: China, Malaysia, South Africa, Brazil, India and the Philippines. Mexico and Egypt, which were part of our MTE sample, have been replaced with Turkey and Chile respectively to increase opportunity for learning.

⁹⁸ The BEIS ‘Activity Tracker’ is an Excel-based internal monitoring tool by BEIS and updated quarterly by the UK Delivery Partners.

The project sample allows for coverage of all DPs and pillars within the Newton Fund portfolio. Six projects were analysed as part of the MTE and again at Final Evaluation to allow for longitudinal analysis. The sample list of 33 calls and projects is annexed to Tetra Tech’s Newton Fund

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- Dr Jim Monaghan, Professor of Crop Science / Director of the Fresh Produce Research Centre, Harper Adams University
- Professor Louise Manning, Director of Knowledge Exchange, Royal Agricultural University.
- UK-based workshop attendee.
- Kenya-based workshop attendee.

Joint call on NCDs

- Professor Daniel Pope, Professor of Global Public Health and Epidemiology, University of Liverpool.
- Dr Diana Menya, Senior Lecturer, Department of Epidemiology and Nutrition, Moi University.
- Dr Iva Čukić, Research Fellow, Public Health and Policy, University of Liverpool.
- Melissa Lennartz-Walker, Newton Fund Programme Manager, Medical Research Council.
- Vanessa O’Sullivan, International Panel Manager, Medical Research Council.

LIF Programme

- Two representatives of the Royal Academy of Engineering.
- Holly Ann Baldwin, Managing Consultant, Oxentia.
- Dr Steve Cleverley, CEO, Oxentia.
- Dr Michael Mbogoro, Senior Consultant, Oxentia.
- Eric Murithi Kithinji, Upesy.
- Kenneth Guantai, Auto Truck.
- Zacharia Kimengich, Senior Orthopaedic Trauma Technician at Kenyatta National Hospital.

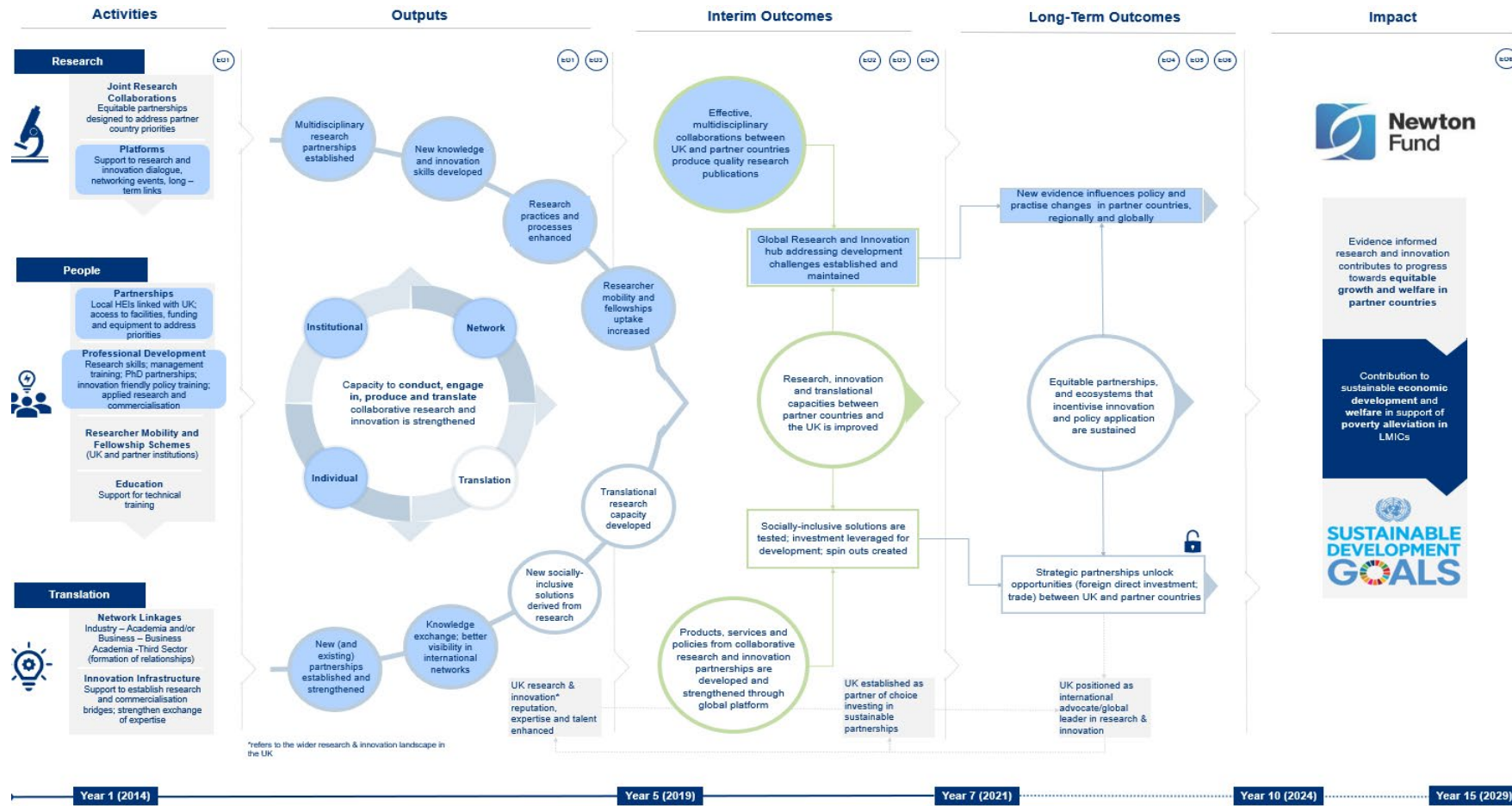
Others

- John Hamilton, Former Head of Prosperity, UK High Commission in Nairobi.
- Dr Salome Guchu, CEO, KENIA.
- Dr Jemimah Onsare, Acting CEO, National Research Fund.
- Dr Eunice Muthengi, Acting Head, East Africa Research & Innovation Hub, Research and Evidence Division, FCDO.
- Aidan Darker, SIN Regional Director.

- Serah Nderitu, Science and Innovation Attaché, UK High Commission in Nairobi.
- Caroline Nyanoti, UK High Commission in Nairobi.

Annex 4 – Theories of Change per Action⁹⁹

Figure 4: Researcher Links Theory of Change



⁹⁹ The figures present the pathways to impact for the three projects reviewed in this case study, set within the overall Newton Fund theory of change. Specific pathways to impact for each project are indicated by the blue shaded shapes in each figure.

Figure 5: UK – Kenya Joint Partnership on Non-Communicable Diseases Theory of Change

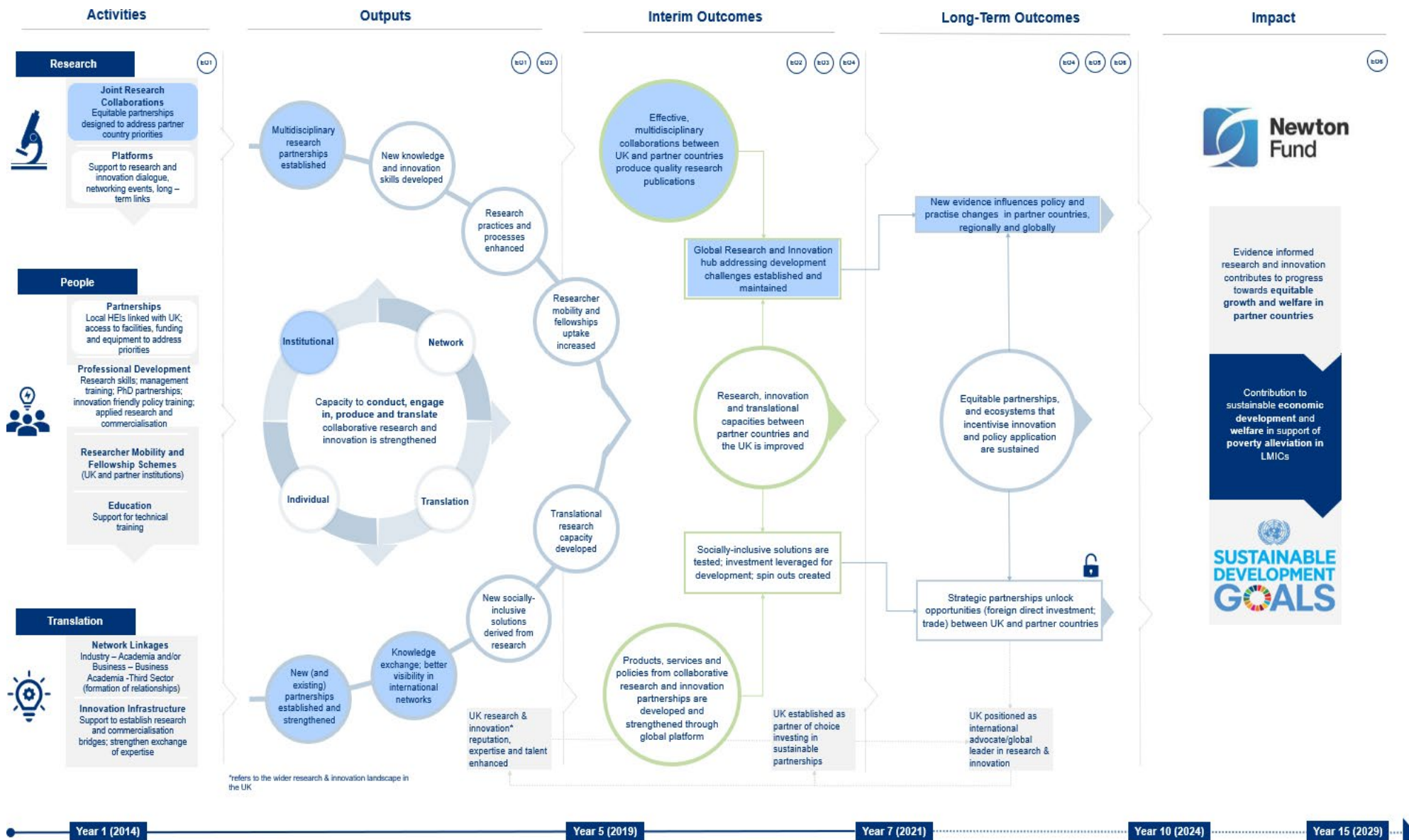
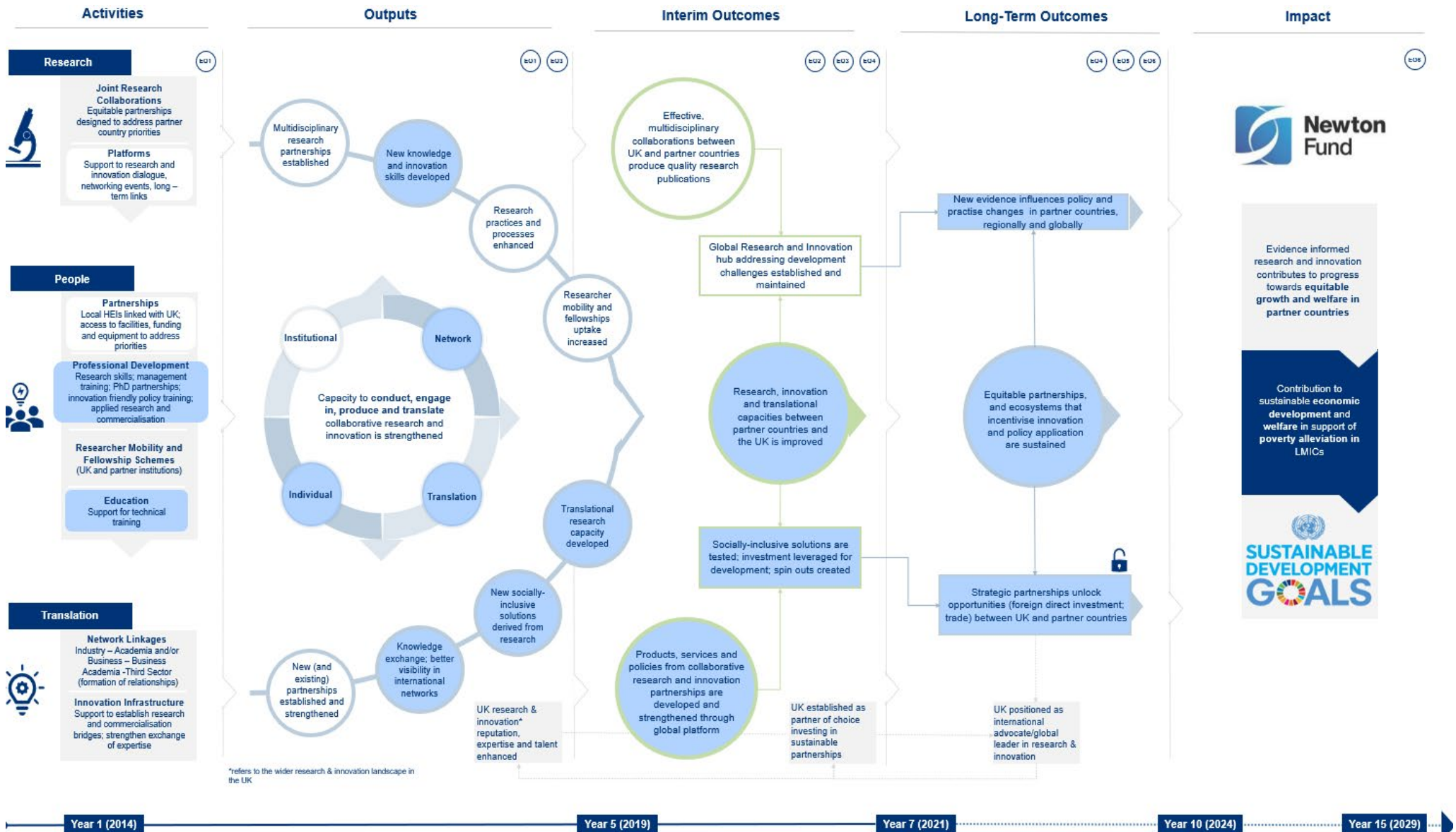


Figure 6: LIF Theory of Change



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