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Partner Country Case Study: Jordan

Final Evaluation of The Newton Fund

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Abbreviations

AH	Award Holder
AHRC	Arts and Humanities Research Council
BEIS	Department for Business, Energy and Industrial Strategy
DAAD	German Academic Exchange Service
DAC	OECD's Development Assistance
DIT	Department for International Trade
DP	Delivery Partner
EDCO	Jordan Electricity Distribution Company
GBP	British Pound Sterling
GIZ	German Agency for International Cooperation
GJU	German-Jordanian University
GoJ	Government of Jordan
HCST	High Council for Science and Technology
HMG	Her Majesty's Government
IAPP	Industrial Academia Partnership Programme
ICT	In-Country Team
ICTs	Information and Communications Technology
IEEE	Institute of Electrical and Electronics Engineers
IRDF	Industrial Research and Development Fund
JOD	Jordanian Dinar
MENA	Middle East and North Africa
MERC	Middle East Regional Cooperation Programme
MoPIC	Ministry of Planning and International Cooperation
MP	Member of Parliament
NDP	National Development Plan
NF	Newton Fund

NKF	Newton-Khalidi Fund
ODA	Official Development Assistance
PI	Principal Investigator
PRIMA	Partnership for Research and Innovation in the Mediterranean Area
PV	Photovoltaic
R&D	Research and development
RAEng	Royal Academy of Engineering
STFC	Science and Technology Facilities Council
STRD II	Support to Research and Technological Development and Innovation
UCN	US-Jordanian Cooperation Network
TSP	Transforming Systems through Partnerships
UK	United Kingdom
UKRI	UK Research and Innovation
US	United States
WTO	World Trade Organisation

Executive Summary

The Newton-Khalidi Fund in Jordan at a glance

- The Newton-Khalidi Fund was the first research and innovation collaboration between the UK and Jordan, against the background of strong historical ties between the two countries.
- The Fund has received strong support from key stakeholders and high-profile public figures in Jordan. Its equitable and partnership-based approach is favourably viewed compared to other donor initiatives.
- The Fund focused on a range of areas including energy, water, food security, cultural heritage, biotechnology, biosecurity and nano-technology. These align closely with Jordan's own priorities.
- Projects supported by the Fund began to be implemented in late 2018 / early 2019, with some delays due to COVID-19. There are however good signs of progress towards achieving overall objectives. Projects supported by the Fund have resulted in increased research capacity and some promising academic collaborations.
- Challenges have arisen in relation to match contributions from Jordanian institutions, the time taken to negotiate with a range of different bodies, and changes at high levels of government. The Fund has nonetheless been able to negotiate these successfully.

The case study

Tetra Tech International Development produced this Partner Country Case Study in Jordan to inform the Final Evaluation Report of the Newton Fund.¹ 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 – Khalidi Fund, and from each a project was selected for in-depth analysis:

- The **Learning from Multicultural Amman: Engaging Jordan's Youth** project addresses lack of engagement with multicultural heritage in Jordan, especially among younger people. The project aims to support children and young people's education and increase public awareness of the importance of protecting cultural heritage. The project benefitted a range of stakeholders across Jordan and the UK, including researchers, museums and heritage professionals, universities, schools, and government agencies.
- The **UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security** project brought UK and Jordanian experts together with early-career researchers to encourage innovative research on solutions to water management challenges in Jordan, one of the most water-stressed countries in the world. The workshop stimulated new and innovative research collaborations and helped identify themes for further research. It also

¹ In this report, 'Newton-Khalidi Fund' refers to the joint UK-Jordan initiative through which funding calls were issued. 'The Newton Fund' refers to the broader UK programme financing activities in 17 countries, including Jordan. The Newton-Khalidi Fund was financed both by Newton Fund contributions and those from Jordanian funding partners.

developed a roadmap for research and knowledge exchanges and future project ideas that could help address Jordan's water management and security challenges.

- The **UK-Jordan Educational and Research Partnership to Build the Capacity of the Power Grid to Integrate Solar Photovoltaic Systems** project is building capacity among Jordanian research institutions to carry out industrial research and establish long-term research collaborations with the UK. Currently, 90% of the electricity in Jordan comes from outside sources and the country faces particular challenges relating to energy storage and limited grid infrastructure. The project has demonstrated the value of academia-industry collaboration and the potential of research to solve industry challenges.

The research was carried out by reviewing documents at project- and Fund-level and carrying out interviews. Between July and August 2020, the team interviewed 25 people from UK and Jordanian institutions. Interviewees came from Delivery Partners in both countries, award holders (AHs) and UK embassy staff, and high-level stakeholders from partner organisations. All the country case studies involved wide-ranging in-country consultations and included as many interview respondents as possible within the short fieldwork timeframe.

The case study is a self-contained investigation and its findings are not intended to be generalised to the entire Newton Fund in Jordan. 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 Fund has resulted in improved capacity for research and innovation (R&I) among researchers, research institutions, government agencies and companies. Examples of the Fund's results include:
 - stimulating innovative research collaborations.
 - developing spin-off projects between researchers and other participants.
 - creating opportunities for early career researchers including hands-on experience.
 - developing solutions to industry problems.
 - creating industry and academia networks in Jordan.
- The strong endorsement of the Fund by key Jordanian stakeholders, a strong brand and the perception that partnerships supported by the Fund are equal are key contributors to its achievements.

Emerging impacts

- Since its launch in 2017, the Newton-Khalidi Fund has made considerable progress, particularly given that most of the partners had not worked together before. **Some signs of emerging impact that are already observable include positive changes in Jordan’s overall research landscape and stronger bilateral relations with the UK.** For instance, collaborations formed under the Fund have improved relationships between Jordan and UK academic communities. The Fund has also improved UK and other country’s perspectives on the value of collaboration with Jordan academics.

Sustainability

- All three projects reviewed in this case study took good account of the need to promote the sustainability of results into their design, increasing the prospect that this will be achieved in practice. The quality of collaboration was also good in all three projects, which led to strong relationships being developed between individuals and institutions in the two countries. This is also likely to support long-term sustainability. Nonetheless, translating research into change on the ground is a long-term process and **it is likely that further funding and longer-term research partnerships will be needed to ensure this emerges.**
- **Despite good progress, some challenges also remain.** Although relationships are overall well-managed, government staff turnover in Jordan and the UK may weaken the sustainability of carefully built relationships among key stakeholders. There is also scope in future initiatives of this kind in Jordan to strengthen knowledge retention and cross-institutional and inter-disciplinary collaborations across the overall portfolio of projects (rather than just within them). This is especially important considering the Fund’s longer-term objectives to establish trilateral research programmes with other Newton countries in the region including Egypt and Turkey.

Complementarity and Coordination

- **The Fund has had a catalytic effect in promoting changes in Jordan’s approach to research and innovation.** Notably, Jordanian interviewees said the Fund’s match funding model as well as its approach to partnership and co-ownership are now being replicated to varying degrees in other Jordanian initiatives. Although it is unclear whether this is wholly attributable to the Newton Fund, the programme did pioneer this approach in Jordan.
- **The Newton – Khalidi Fund is more wide-ranging and comprehensive than other donor programmes in Jordan.** It provides access to a wide range of UK Delivery Partners, who bring different areas of expertise to the table allowing a multi-disciplinary and holistic approach to addressing development issues. The three pillars (People, Research and Translation) are complementary: activities under one pillar may contribute to outcomes resulting from work done under another.

Lessons learned

- **Setting up partnerships is a time-intensive process,** especially in countries with no pre-existing research and innovation collaborations with the UK, and where there is no single authority responsible for research and innovation (as in Jordan). The Fund’s experience highlights the importance of an inception phase long enough to engage with potential stakeholders, build strong relationships, and firmly establish the programme.
- The Fund’s match funding requirements may not be appropriate or feasible for all potential partner countries and institutions. Securing match funding in Jordan was particularly difficult because partner institutions lacked funds. **This was successfully addressed however by allowing contributions in-kind.**

- Strict funding allocation requirements can limit the potential for project impact and sustainability. **More flexibility would be helpful in this regard, for instance to allow some funds to be used for follow-on activities.** This could support the consolidation of new relationships, harnessing research findings and undertaking further activities to increase impact.
- **Project activities are not always complemented by advocacy or dissemination.** The potential to translate research into change through policy uptake, is also limited by the short-term projects.
- There are signs UK and Jordanian partners are creating sustainable partnerships, and there is interest in ongoing collaboration. **To build on this momentum, partners would benefit from greater clarity on the Fund's future direction.**

Considerations and recommendations for the Newton-Khalidi Fund

- **Research activities should be complemented by greater communication, dissemination, and advocacy efforts to ensure project results' sustainability and progress towards impact.** Building these activities into project plans from the outset will allow for further policy uptake of research and recommendations.
- **The Newton-Khalidi Fund would benefit from better coordination at the Fund level to allow for knowledge retention and exchange and, consequently, stronger cross-institutional and inter-disciplinary collaborations.** There is potential for more cross-institutional coordination, learning and aligning priorities. This is especially important considering the Fund's longer-term objectives to facilitate close engagement with other Newton countries in the region, Egypt and Turkey and establish trilateral research programmes.

1 Introduction

1.1 Aim and purpose of the case study

This report presents findings for our country case study of activities under the Newton – Khalidi Fund in Jordan. While these findings will inform the Newton Fund’s final evaluation, they are specific to the country under investigation and not generalisable 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.

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 – Khalidi Fund in Jordan, 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 – Khalidi Fund, based on remote research was carried out in July and August 2020. 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 Jordan’s development needs and to Newton Fund and Official Development Assistance (ODA) goals.
- the **additionality of each activity**.²
- 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 Jordan 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.

² 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 Jordan when the projects were selected.

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

Funding Call	Projects
Cultural Heritage and Sustainable Development in Jordan	Learning from Multi-Cultural Amman: Engaging Jordan’s Youth
Researcher Links Workshop	UK – Jordan Joint Workshop on Sustainable Catchment Management and Water Security
Industry – Academia Partnerships Programme	UK – Jordan Educational and Research Partnership to Build the Capacity of the Power Grid to Integrate Solar Photovoltaic systems

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 Jordan case study, we consulted 25 UK and Jordanian 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).³ 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

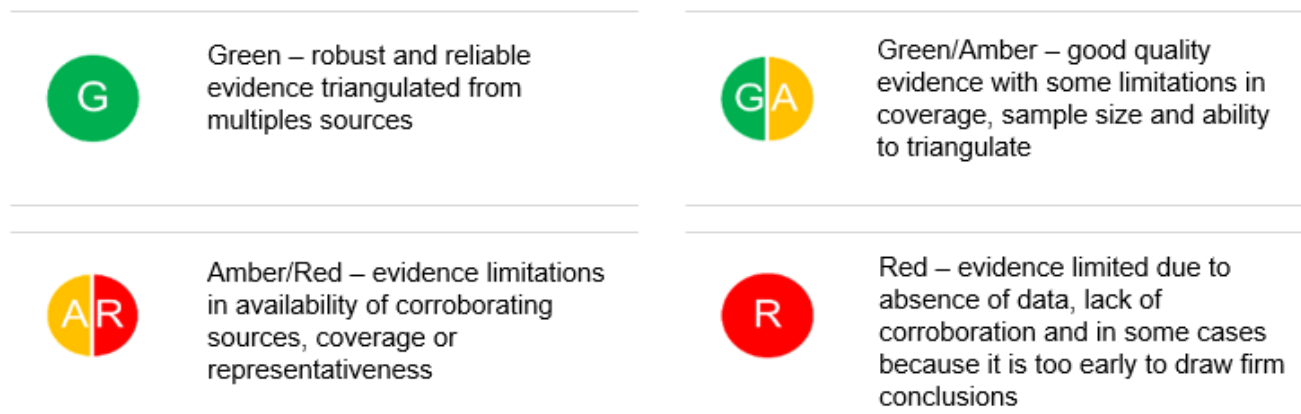



Table 1: Strength of Evidence for the Newton – Khalidi Programme case study

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 – Khalidi 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>

³ 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 rest of this report is structured as follows:

- **Section 2** introduces the context in Jordan, including political and economic developments and trends in the research and innovation R&I landscape.
- **Section 3** discusses high-level emerging results of the Newton – Khalidi Fund in Jordan 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 – Khalidi Fund in Jordan

Jordan and the UK established the Newton-Khalidi Fund in August 2017 to strengthen their research and innovation cooperation. In terms of bilateral ties between Jordan and the UK, the Newton-Khalidi Fund represents the first instance of scientific collaboration between the two countries but forms only a small part of the wider and longstanding relationship between the UK and Jordan.

The Fund identified the following priority areas: energy, water management, agri-tech and food security, cultural heritage, biotechnology and biosecurity, and nanotechnology. These areas are in line with the country's strategic objectives and long-lasting challenges to sustainable economic growth.

The Newton-Khalidi Fund's objectives for 2017-2021⁴ include:

- significant R&I outputs delivered by Jordan and the UK which support economic development in Jordan.
- links to research communities in Turkey and Egypt, through effective institutional links, technology transfer and a commercialisation system that support Jordan's productivity.
- the UK being Jordan's number one international research partner (secondary).

A distinctive feature of the Newton Fund overall 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. This differentiates it from traditional bilateral development assistance.

2.2 Political and economic context

A relatively stable kingdom in a volatile region, Jordan has largely avoided the political upheaval in some of its neighbours. However, nearby conflict and refugee inflows have strained its political system and economy.

The Hashemite Kingdom of Jordan is a small country with few natural resources, located at the heart of a highly volatile region. It is a constitutional, hereditary monarchy with a parliamentary, multi-party system, although parliament plays a limited role in the governance of the country. The constitution vests the King – Jordan's Head of State – and his cabinet with executive power. The King also appoints a Prime Minister. King Abdullah II has been in power since 1999, following the death of his father. Omar Razzaz was Prime Minister from June 2018 until October 2020, when he was replaced by Bisher Khassawneh. Political parties were legalised in 1992. The country's main political forces include the Islamic Action Front (a faction of the Muslim Brotherhood in the country), the Islamist Centrist Party, Zamzam and the National Current Party.⁵ Despite significant protests in 2011 and 2012 Jordan's monarchy and political system survived the Arab Spring protests that swept the region.

⁴ Jordan Newton-Khalidi Fund Strategy, 2017-2021.

⁵ Nordea Country profile 'Jordan'(n.d.) Available at: <https://www.nordeatrade.com/en/explore-new-market/jordan/political-context>

Despite its small economy, Jordan is an upper-middle-income country with GDP per capita of USD \$4,405 in 2019, ranking in the middle of the table of countries in the Middle East and North Africa (MENA) region, after oil-rich countries, Turkey and Lebanon.⁶ Jordan had a Gini coefficient⁷ of 33.7 in 2010, the most recent year for which this data is available, making it one of the more equal countries in the Middle East.⁸

For almost 70 years since independence, Jordan has bordered the main conflict zones in the MENA region. It has received a high numbers of refugees, initially from Israel / Palestine and more recently from Iraq and Syria, straining the country's material resources. Jordan's relative stability in comparison to the rest of the region comes at a high cost. Its ratio of military expenditure to GDP per capita is ranked 5th globally⁹, with 3.5% of GDP was allocated to its military budget in 2013.¹⁰ Moreover, unlike most of its neighbours, Jordan lacks natural resources such as oil and gas and also faces the challenges of aridity and scarce water resources.

At independence, Jordan was an agricultural country. Between the 1960s and the 1990s, it underwent a process of transformation towards being a semi-industrialised economy. During this time the country shifted away from import substitution policies and gradually liberalised its economy. It signed free trade agreements with the USA and Turkey, and in 2000 became a member of the World Trade Organisation (WTO).

Government efforts have focused on moving progressively towards being a service economy, investing in the pharmaceutical, healthcare and telecommunications sectors. Currently, the main contributions to the Jordanian economy come from manufacturing (26% in 2018), financial services (20%), tourism (19%), transportation (10% in 2008), and remittances from abroad (7% in 2015). Services currently account for 62% of national GDP.¹¹

⁶ BBC News (2013) 'Arab uprising: Country by country – Jordan' Available at: <https://www.bbc.com/news/world-12482679>

⁷ Measure of statistical dispersion intended to represent the income inequality or wealth inequality within a nation or any other group of people.

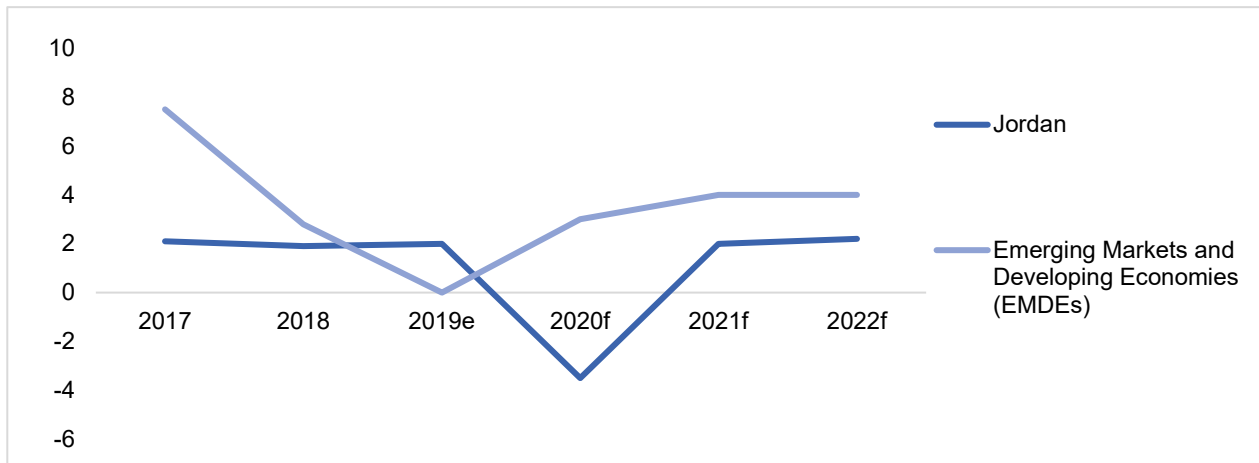
⁸ World Bank (n.d.) Data: Gini index: <https://data.worldbank.org/indicator/SI.POV.GINI?locations=JOT-JO> The Gini coefficient indicates income distribution across income percentiles in a population. A higher Gini coefficient (approaching 100) indicates greater inequality. Available at: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZQ>

⁹ Sami Mahroum et al. (2013) 'Jordan: The Atlas of Islamic World Science and Innovation Country Case Study', p. 15.

¹⁰ UNESCO Science Report (2016) 'Towards 2030, United Nations Educational, Scientific and Cultural Organisation', 2nd edition, p. 433.

¹¹ GOV.UK (2018) 'Factsheet Dataset Jordan'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846645/1119_Jordan.pdf

Figure 2: GDP growth in Jordan and all EMDEs – baseline to end line figures (estimate and forecast)



Source: World Bank¹²

Despite these efforts, the country’s economic performance has been mixed. The consumer price index has risen by 25% since 2010, while average wages remain stable.¹³ Unemployment also rose sharply in the last decade to 18.7% in the fourth quarter of 2018. While the unemployment rate is 15.5% for men over 25, this increases to 24.1% for women over 25, and 37.3% among all young people aged 18 to 24.¹⁴

Jordan has become increasingly dependent on international aids to manage the refugee crisis which followed the Syrian civil war.¹⁵ Jordan is included in the OECD’s Development Assistance (DAC) list of Official Development Assistance (ODA) recipients as an upper-middle-income country for the period 2014 to 2017.¹⁶ The World Bank estimates that the impact of COVID-19 will have lasting effects on Jordan’s growth performance in the medium term¹⁷, with an expected contraction of national GDP by 3.5% in 2020.

2.3 Research and innovation landscape

Jordan is a highly educated, knowledge-based society in which education plays a pivotal role in the economy. Since independence, the Jordanian government has regarded the development of human capital as key to the country’s socio-economic development.¹⁸ The National Charter

¹² Emerging Market and Developing Economies (EMDEs) comprise a large and diverse group of states whose financial systems have grown in importance over the last decade Based on IMF classification, 150 countries are classified as EMDEs (Available at: https://www.fsb.org/wp-content/uploads/r_111019.pdf?page_moved=1). The World Bank (2020) Global Economic Prospects, Middle East and North Africa. Available at: <http://pubdocs.worldbank.org/en/950801588788414569/Global-Economic-Prospects-June-2020-Analysis-MENA.pdf> p.91

¹³ CEIC ‘Jordan Consumer Price Index: 2010=100’. Available at: <https://www.ceicdata.com/en/jordan/consumer-price-index-2010100/cpi-fb-food>

¹⁴ Unemployment among young people (18–24 years) was 46 percent for women and 23 percent for men as of the fourth quarter of 2018. Source: CEIC, Jordan Unemployment Rate. Available at: <https://ilostat.ilo.org/data/country-profiles/>

¹⁵ Alexander Betts and Paul Collier (2016) ‘Jordan’s Refugee Experiment: A New Model for Helping the Displaced’, Foreign Affairs, 28 April 2016. Available at: <https://www.foreignaffairs.com/articles/middle-east/2016-04-28/jordans-refugee-experiment>

¹⁶ IMF ‘Policy responses to COVID-19’. Available at: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#J>

¹⁷ World Bank (2020) ‘Jordan’s Economic Update’, April 2020. Available at: <http://pubdocs.worldbank.org/en/914661554825485360/mpo-jor.pdf>

¹⁸ Khaled Elshuraydeh (2006) ‘Science and Technology and Innovation Profile of Jordan’, Evaluation of Scientific and Technological Capabilities in Mediterranean Countries (ESTIME), p. 3. Available at: http://www.idaea.csic.es/sites/default/files/Final_report_Jordan_IM_RA.pdf

adopted in 1991 recognised the importance of science and technology for Jordan and established the principle of academic freedom for this purpose.¹⁹

The majority of scientific research in Jordan is carried out within the higher education system.²⁰ Jordan has ten public universities – including the University of Jordan, regarded as the country’s centre of excellence, 17 private universities and 51 community colleges.²¹

In 2005, Jordan introduced a law transferring 1% of public companies' net profits to finance research and development (R&D). Another law prescribes that both public and private universities allocate 5% of their budgets to R&D.²² Despite this, Jordan’s R&D expenditure remains low, amounting to 0.71% of GDP in 2016 against the world average of 2.17%.²³

Following a decrease of 14% over five years, in 2019 Jordan ranked 86 out of 129 countries in the Global Innovation Index.²⁴ In the MENA region, Tunisia, Morocco, Kuwait and Saudi Arabia scored higher. In 2020, more than 44,000 international students were studying in Jordan.²⁵ In terms of research activity (as indicated by article outputs), Jordan was ranked 62nd in the 2018 Scimago Journal & Country Rank.²⁶

Table 2 illustrates fields of academic research specialism for Jordan compared to the rest of the world (scores above one represent greater specialisation than the global average). This highlights the focus of Jordan’s academic research in maths, ICT, agricultural science and social science. In contrast, the country is significantly less focused on biology, biomed, and physics compared to the global average.

Table 2: Jordan’s specialisation in selected research fields

Subjects	2013	2014	2015	2016	2017	2018
Agricultural Science	1.72	1.22	1.17	1.22	1.29	1.20
Biology and Biomed	0.57	0.69	0.77	0.69	0.67	0.61
Chemistry	0.77	0.72	0.61	0.50	0.61	0.68
Geosciences, Atmospheric, and Ocean Sciences	n.a.	n.a.	0.80	n.a.	n.a.	n.a.

¹⁹ National Legislative Bodies / National Authorities (1991). *Jordan: Jordanian National Charter of 1991*, 1 June 1991, available at: <https://www.refworld.org/docid/3ae6b53b4.html>

²⁰ UNESCO (2016) Science Report: Towards 2030, United Nations Educational, Scientific and Cultural Organisation, 2nd edition, p. 438.

²¹ Ministry of Higher Education and Scientific Research (n.d.) Brief on Higher Education Sector in Jordan Available at: <http://www.mohe.gov.jo/en/pages/BriefMohe1.aspx>

²² Suhail Sami Sultan and Luc Soete (2012) 'Innovation for Development: the case of Jordan', *Disarat: Administrative Sciences*, 39 (2), p.324. Available at: <https://fada.birzeit.edu/jspui/bitstream/20.500.11889/5370/1/%289-5%29.pdf>

²³ UNESCO (n.d.) Institute for Statistics, Research and development expenditure. Available at: <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>

²⁴ Global Innovation Index (2020) Analysis. Available at: <https://www.globalinnovationindex.org/analysis-indicator>

²⁵ UNESCO (n.d.) Global Flow of Tertiary-Level Students. Available at: <http://uis.unesco.org/en/uis-student-flow>.

²⁶ *SJR (n.d.) Scimago Journal & Country Rank*. <https://www.scimagojr.com/countryrank.php?year=2018>

ICT	1.70	1.58	1.99	1.77	1.98	2.05
Engineering	0.92	0.86	0.89	0.96	0.88	0.86
Health Services	1.00	1.01	0.94	0.94	1.05	1.05
Materials	0.93	N.A.	0.85	0.81	0.56	0.81
Maths	2.49	2.76	2.06	2.30	2.13	2.31
Physics	0.54	0.56	0.42	0.48	0.42	0.54
National Resources and Conservation	1.3	n.a.	1.45	0.92	0.92	1.1
Social Sciences	1.72	2.29	1.71	2.50	2.06	1.38

Source: Scopus (data sourced from U.S. National Science Foundation). N.a. = not applicable / not eligible.

Note: the figure represents a measure of the concentration of a country's publications in a field, by dividing the fraction of publications in a country that are in a certain field by the equivalent global fraction. A score higher than 1 shows that the country is more specialised than the global average, and a score lower than 1 shows that the country is less specialised.

International relations and research collaborations

Jordan enjoys long-standing relationships with western countries, including the UK, for whom it has historically been a strategic partner in the Middle East. Jordan also has particularly strong ties with the United States, the European Union and the Gulf Cooperation Council. Aside from its diplomatic standing, Jordan is a key trading partner for European countries including the UK. This strategic interest was underlined at the Supporting Syria and the Region: London Conference in 2016 where Jordan signed up to receive funding of USD \$1.7 billion in return for improving access to education and legal employment for the Syrian refugees it was hosting.²⁷

In addition, the US and Jordan signed a Memorandum of Understanding in 2018 that provided USD \$6.4 billion in aid to Jordan for the period up to 2022.²⁸ Germany is Jordan's most important European partner and second-largest donor after the USA.²⁹ The two countries maintain close ties in a host of domains from security to the economy, with a specific focus in information and communications technology.

In relation to research and innovation, Germany opened the German-Jordanian University (GJU) in 2005, which specialises in engineering and business.³⁰ The USA and Jordan also launched the US-Jordanian University Cooperation Network which fosters partnerships between American and

²⁷ Maher Ghanma, Sophie Dembinski and Daniel Jorner (2017) 'The UK's role in Jordan and the wider Middle East post-Brexit'. Available at: <https://www.dlapiper.com/en/uk/insights/publications/2017/12/the-uks-role-in-jordan-and-the-wider-middle-east-postbrexit/>

²⁸ Xinhuanet (2018). http://www.xinhuanet.com/english/2018-02/15/c_136976308.htm

²⁹ Federal Foreign Office (2020) 'Germany. Jordan and Germany: Bilateral Relations'. Available at: <https://www.auswaertiges-amt.de/en/aussenpolitik/laenderinformationen/jordanien-node/jordan/227494>.

³⁰ Ibid.

Jordanian universities³¹ and the two countries also collaborate in the Middle East Regional Cooperation Programme, which focuses on research and innovation to promote peaceful cooperation and cultural exchange between Arab and Israeli scientists.³² Finally, the European Union and Jordan signed an international agreement on Jordan's participation in the Partnership for Research and Innovation in the Mediterranean Area (PRIMA) in 2017, supported by Horizon 2020, the EU's research and innovation framework programme.³³

Jordan – UK relations

In 2019 the UK doubled its bilateral support to Jordan, pledging £650 million over five years.³⁴ This is part of a five-year initiative to support the Jordanian economy through a programme of private-sector reform, macroeconomic reform and measures to increase youth employment.³⁵

Relations between Jordan and the UK, and perceptions of the UK in Jordan have historically been good. Before the Newton Fund, there were no UK-Jordan relationships or specific UK presence in the Jordanian R&I landscape. Rolling out the Newton Fund in Jordan therefore required the development of new relationships with officials and agencies in this field. The UK's strong diplomatic connections and reputation in government circles greatly helped with the successful establishment of the Fund.

Funding initiatives similar to the Newton Fund

Table 3 outlines other donor initiatives to strengthen research and innovation in Jordan. A degree of overlap between the work of the Fund and EU initiatives is notable.

Table 3: Funding Initiatives Similar to the Newton Fund

Funding Initiatives	Details
Scientific Research and Innovation Support Fund (2007 – ongoing)	Administered by Jordan's Ministry of Higher Education and Scientific Research, the Fund supports entrepreneurial ventures and helps Jordanian companies to solve technical problems, encouraging private bodies to allocate resources for R&D on projects related to energy, water, and health care.
Partnership for Research and Innovation in the Mediterranean Area (PRIMA)	Joint research programme (part of Horizon 2020) between the EU and Mediterranean countries (Algeria, Egypt, Jordan, Lebanon, Morocco) supporting research on efficient and sustainable food production and water provision. ³⁶

³¹ U.S.-Jordanian University Cooperation (2019) 'Network Workshop'. <https://gti.ncsu.edu/wp-site/wp-content/uploads/2019/10/GTI-Jordan2019.pdf>.

³² USAID (2021) MIDDLE EAST REGIONAL COOPERATION (MERC) Available at: <https://www.usaid.gov/where-we-work/middle-east/merc>

³³ European Commission (n.d.) Jordan. Available at: <https://ec.europa.eu/research/iscp/index.cfm?amp;pg=jordan>

³⁴ The Euro-Gulf Information Centre (2018) 'Jordan: A Gateway to EU-GCC Relations'. Available at: <https://www.egic.info/jordan-a-gateway-to-eu-gcc-relation>

³⁵ GOV.UK (2019) New Jordan Taskforce launched to ensure London Conference commitments. Available at: <https://www.gov.uk/government/news/new-jordan-taskforce-launched-to-ensure-london-conference-commitments>

³⁶ European Commission (n.d.) Jordan. Available at: <https://ec.europa.eu/research/iscp/index.cfm?amp;pg=jordan>

<p>Support to Research and Technological Development and Innovation in Jordan (SRTD II)³⁷ 2013 – 2017</p>	<p>SRTD-II focused on supporting applied research based on national priorities, involving the private sector with defining research needs and helping transform innovative research ideas into commercially viable projects. The project has a thematic focus on water, energy, food, and health.</p>
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³⁷ Mediterranean Science, Policy, Research & Innovation Gateway (n.d.) SRTD II Project. Available at: <http://www.idaea.csic.es/medspring/link/srtd-ii-project>

3 Emerging results of the Newton-Khalidi Fund in Jordan

This section sets out the emerging results of the Newton – Khalidi 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

The Newton-Khalidi Fund has been well received in Jordan and has already led to some achievements. Along with research and innovation being a priority development area for Jordan, other supporting factors that have enabled this progress include:

- **Strong endorsement of the Fund by key stakeholders.** This includes high-level government officials and overarching governmental and non-governmental bodies with different mandates in the R&I sphere in Jordan, such as the Royal Scientific Society, Higher Council for Science and Technology and the Government of Jordan. As a result, the Fund enjoys buy-in at the highest levels.
- **A strong Newton-Khalidi Fund brand resulting from successful promotion.** The decision to name the Fund after a prominent Jordanian scientist, the late Dr Usama Khalidi helped in securing recognition for the Fund among academics and the wider public. The In-Country Team (ICT) at the embassy in Amman also did a good job promoting the Fund at various events.³⁸ Generally, the name of the Fund is well-received and appeals to Jordan's academic community. The strong endorsement by high-level public figures such as HRH Princess Sumaya bint El Hassan, President of the Royal Scientific Society, also contributed to the development of a strong brand.
- **The Fund is not seen as development aid but rather as an equal partnership on both the UK and Jordanian sides.** This is due to the strong emphasis on building partnerships, creating buy-in, sharing ownership, and securing commitment. Jordan's recent investment of JOD 1 million (GBP £1.07 million) in the Fund is a good example of this commitment.

Respondents indicated that they generally see the UK as a desired partner of choice for academic cooperation. This is supported by:

- **strong familiarity with UK academia.** Many Jordanian stakeholders have studied in the UK and have a strong interest in working with UK institutions on R&I. Jordan also has a relatively high English proficiency level and the Royal Hashemite Court – the administrative and political link between the King and his government – officially operates in English, making English language studies highly relevant. Consequently, institutional educational ties between Jordan and the UK are strong and many Jordanian researchers are pursuing PhD studies in the UK. There were 1,806 Jordanians studying in the UK in 2020, with the UK the fourth most popular destination.³⁹

³⁸ The Jordan Times (2020) 'Event celebrates Newton-Khalidi Fund's achievements in promoting int'l research'. Available at: <https://www.jordantimes.com/news/local/event-celebrates-newton-khalidi-funds-achievements-promoting-intl-research>

³⁹ Unesco (n.d.) Global Flow of Tertiary-Level Students. Available at: <http://uis.unesco.org/en/uis-student-flow>

- **high regard for the UK academic community.** There is also high regard for UK institutions in general and perceptions that the system is fair and transparent. Interviewees said this created more equal and inclusive access for researchers.

Additionality of the Newton-Khalidi Fund in Jordan

Although some overlap exists between the research and innovation programmes presented in Section 2, this is primarily on thematic focus areas. **The Newton-Khalidi Fund is considered to be unique compared to other donor initiatives in Jordan in the way it operates.** Compared to similar programmes, the Newton Fund is more wide-ranging and comprehensive and offers a more integrated approach. Key elements of this include:

- **Offering access to a wide range of UK Delivery Partners (DPs),** with different areas of expertise. Seven UK DPs are active in Jordan: the British Council, the British Academy, Innovate UK, the Royal Academy of Engineering (RAEng), UK Research and Innovation (UKRI), the Arts and Humanities Research Council (AHRC), and the Science and Technology Facilities Council (STFC). Altogether, their areas of expertise and the varied research communities they provide ensures a multi-disciplinary and integrated approach to addressing development priorities.
- **Ensuring and multi-disciplinary approach** in which a diverse set of stakeholders are engaged has helped ensure that: i) relationships are built at various levels of government, institutions, research communities, and industries; and ii) projects are informed by their needs. The three different pillars (People, Research and Translation) are also seen as complementary, with work under one pillar contributing to outcomes under one of the others.
- **Emphasising partnership and co-ownership, rather than just cooperation.** This approach goes beyond having a shared name and focuses on building partnerships and co-production at all levels (government, Delivery Partners, research institutions), creating buy-in and ownership and ensuring relevance. Match contributions help ensure programmes meets the needs of all stakeholders. This requires a certain amount of negotiation and commitment but also encourages the development of strong relationships.

Several respondents described the Newton-Khalidi Fund as a particularly successful programme among other donor initiatives in Jordan. For instance, respondents spoke about the additionality of the Newton-Khalidi Fund and its positive results compared to other initiatives.

Emerging impacts of the Newton-Khalidi Fund in Jordan

The Newton-Khalidi Fund has made good progress in commissioning and implementing projects, with some signs of impact emerging.

Impact on donor landscape

Respondents spoke about behaviour changes in the broader sector, whereby others replicate the Newton-Khalidi Fund match funding model. Respondents mentioned that various other programmes in Jordan have started to use match funding arrangements in varying degrees, for instance requiring participating institutions or researchers to contribute to activities. Other elements of the Fund, such as its partnership approach are also now being applied elsewhere. While it is unclear whether this is wholly attributable to the Newton Fund, the programme did pioneer this approach in Jordan.

Impact on Jordan-UK bilateral relations

Although science diplomacy is not the Fund's main objective, it is a major secondary effect of the programme with considerable benefits for bilateral relations.

While strong bilateral relationships existed before the Newton-Khalidi Fund, there was no formal UK presence in the R&I sphere in Jordan. The Fund has created helped to access and build new relationships with institutions at different levels, for instance:

- the programme has enabled the British Embassy in Amman to engage in conversations with stakeholders within the Higher Council for Science and Technology, the Royal Scientific Society, and the Ministry of Higher Education and Scientific Research among others.
- The programme also acts as an entry point for other embassy teams including for example the Department for International Trade.
- At the Delivery Partner level, UK DPs spoke about having had the opportunity to collaborate with stakeholders they had not worked with before, including the Department of Antiquities, the Industrial Research and Development Fund, and the Ministry of Higher Education and Scientific Research.

There are indications the Fund's nature has helped shift the narrative on cooperation between the UK and Jordan. Respondents spoke about moving away from a predominant foreign aid narrative in which the Syria humanitarian crisis is paramount, **to a broader approach focused on Jordan's economy and research collaboration.**

Impact on research landscape in Jordan and UK perspectives

The collaborations formed under the Fund in Jordan have significantly strengthened relationships between the Jordan and UK academic communities. Respondents also highlighted that the Fund has heightened awareness within the UK academic community on the advantages of working with Jordanian institutions.

Research collaborations with Jordan have traditionally focused on a few niche fields, such as archaeology and cultural heritage. Collaborations under the Newton-Khalidi Fund introduced academics from the UK and beyond to other research fields in Jordan and the potential for collaboration and knowledge exchange in these fields. They have also provided opportunities to work with academics in the Middle East which have been restricted in other countries due to unrest and conflict.

Impact on the wider socio-economic context in Jordan

Although its wider socio-economic impact is unlikely to be observed in the short-term, there are indications that the work being carried out under the Fund will have wider benefits. Respondents shared various examples of early signs of impact, such as success stories of Jordanian innovators who have started to benefit from working with UK DPs, and collaborations that have opened doors for further links with other researchers and academics, not only in the UK but also in other countries in which the UK DPs work.

Other examples relate to likely benefits achieved by the portfolio of Newton-Khalidi Fund projects, including improving graduates' employability and creating opportunities for students in a country that is stifled by youth unemployment. In some cases, projects employed graduates to support research activities, offering relevant work experience and improving employability. In other cases, projects focused on school children and students, improving learning outcomes overall.

3.2 Challenges

- **The main challenge the programme encountered was securing match funding from Jordanian counterparts.** Securing match funding was particularly challenging due to the large number of stakeholders involved, and because of the absence in Jordan of a single research and innovation entity. As a result, agreements had to be made with various stakeholders, most of whom have very tight budgets due to public spending restraints.
- Allowing most match-funding commitments to be based on in-kind contributions, proved an **effective strategy in mitigating what would otherwise have been a serious constraint on the success of the Fund.** Stakeholders from both the Jordanian and UK sides praised the flexibility that allowed this.
- **The Fund's experience in Jordan highlights the need for an inception phase long enough to navigate various potential stakeholders and build strong relationships with them.** Despite having secured commitment at ministerial level, negotiating the level and form of match contributions and agreeing allocation processes with Jordanian partners was challenging and time consuming. The Fund's **steering committee of high-level government stakeholders** set up by the ICT was credited with helping this process. Nonetheless, the fact that the embassy's ICT and the respective UK DPs had to negotiate separately with Jordanian partner institutions based on their individual funding capacities delayed the launch of several projects.
- **Another important challenge was government turn-over and the loss of institutional ownership.** In the short time the programme has been running, there have been four government reshuffles with accompanying staff changes. Each reshuffle created challenges in sustaining relationships with key stakeholders, such as with the Minister of Planning and International Cooperation, the Minister of Higher Education and Scientific Research and the Minister of Tourism and Antiquities. While the challenges resulting from staff turn-over were managed well by the ICT, rebuilding relationships further affected delivery timelines.
- **Given the lack of a single authoritative Jordanian counterpart, the Fund would have benefitted from a central platform for coordinating between the different calls, projects, and partners and for retaining this knowledge.** Difficulties in coordination were cited by respondents as limiting some opportunities for stronger, cross-institutional and inter-disciplinary collaborations. If the Newton-Khalidi Fund is extended or scaled up in Jordan, it would benefit from coordination mechanism and knowledge repository that creates opportunities for future collaboration and learning.

4 Project: Learning from Multicultural Amman: Engaging Jordan's Youth

Summary

Project title	Learning from Multicultural Amman: Engaging Jordan's Youth
Call title	Newton-Khalidi: Cultural Heritage and Sustainable Development in Jordan
Short description	Work with museums, schools and universities to stimulate the interest of young people in museums in Jordan and in learning about their heritage.
Objective(s)	<p>The project aims to:</p> <ul style="list-style-type: none"> • identify existing good practice for engaging young people in learning about the past through partnerships between museums, schools, and universities. • deliver a training programme on museum education for professionals and academics. • hold educational events to engage young learners, led by trained museum staff in collaboration with schools and universities. • create and disseminate guidelines on museum education. • use these for advocacy with policy-makers on the educational benefits of museums.
Pillar	Research
Acton value (total budget allocated in country, in GBP)	<p>£241,169 (UK)</p> <p>In-kind support from Jordanian partners in the form of:</p> <ul style="list-style-type: none"> • Time of researchers from the Hashemite University. • Time of staff from the Department of Antiquities. • Access to facilities.

Start/end date (Status: on-going or complete)	February 2019 – January 2021 ⁴⁰ (Status: ongoing – delayed due to COVID-19)
DP UK and overseas	The Arts and Humanities Research Council (AHRC) (UK) and the Department of Antiquities (Jordan)
Award holders/ grantees	Durham University and Hashemite University

Description of the project

The Learning from Multicultural Amman: Engaging Jordan's Youth project is part of the Arts and Humanities Research Council (AHRC)'s 'Cultural Heritage and Sustainable Development in Jordan' call, which funds collaborative UK-Jordan research projects exploring the role of cultural heritage in delivering sustainable economic growth and social welfare.

The project is designed to address lack of engagement with multicultural heritage among younger people in Jordan. It is training museum staff, teachers, and university lecturers to improve their capacity to take advantage of the rich educational resources of Jordan's museums for teaching purposes, to create better opportunities for their students to value the country's rich past, and to generate more awareness of the value of museums in education.

The partners in the project include AHRC (UK), the Department of Antiquities (Jordan), Durham University and Hashemite University, as well as Sela, a Jordanian NGO that works to preserve cultural heritage and actively engage host communities in its protection.

Pathway to impact

This project fits well within the Newton Fund's Theory of Change for Research pillar projects, as presented in Annex 4, Figure 3. The project also includes outputs and outcomes under the People and Translation pillars by undertaking joint research collaborations and also improving research capacity. Although this is not the main aim of the project, it is also creating links between museums and academia.

The main **activities** of the project are to: i) carry out research activities to better understand museum education practice in Jordan, run training courses for museum officers, and develop a set of best practice guidelines; and ii) design and deliver a training course that responds to the needs of museum staff and helps provide better learning opportunities for youth and children.

The research activities included focus groups with 48 participants, including staff from private and public museums, schoolteachers and academics. Based on this two training programmes for museum and cultural heritage professionals were designed and delivered by the AHs.

Outputs:

- A four-day training course in Jordan covering the basics of professional museum work as well as more specialised topics, such as museum education for young people.

⁴⁰ The end date may be extended as a result of COVID-19 delays.

- An eight-day training course in the UK to provide a wide-ranging and customised programme on museum education and research for public and private museums.
- Guidance on museum best practice, to be adopted across Jordan, informed by the research and other project activities.
- Development of networks between stakeholders that traditionally did not interact, including schools, universities, museums, the Department of Antiquities and the Ministry of Higher Education and Scientific Research.

Expected outcomes: More interesting, enjoyable and memorable museums in Jordan, and greater capacity among museum, university, and schools to take advantage of the educational resources of Jordanian museums for teaching. Greater awareness among decision-makers of the role of museums in national education.

Expected impact: Stronger interest and awareness among young people in Jordan's cultural heritage and its protection.

4.1 Emerging project results

Relevance of Newton Fund activities

Relevance to country development and ODA priorities

With its focus on protecting cultural heritage and the role of cultural heritage in social development, the project fits well with the Newton – Khalidi Fund's 2017-21 priorities for Jordan, particularly Priority 4 (Cultural Heritage), and the country's economic development strategy, which highlights the importance of education in broader social development. Given Jordan's large youth population and high youth unemployment, investing in young people through education to address imbalances in the labour force is a key priority for the country, and is in line with ODA priorities.

The project has an indirect relevance to economic growth goals. In particular, public awareness of its value is thought to be key to protecting cultural heritage, which is the main asset for the country's tourism industry.

Relevance to participating institutions

The collaboration brought together a diverse set of stakeholders in the museum and heritage sector including representatives from private and state-owned museums and other museum and heritage professionals, universities, schools and government agencies in both countries. This bottom-up and inclusive approach ensured that all project outputs and outcomes were relevant to the participants and their respective institutions and reflected the wider heritage sector's challenges.

Additionality

The project has high levels of additionality, as the collaboration would not otherwise have occurred without the Newton-Khalidi Fund. The Fund was in fact the only funding source the AHs applied to. Interviewees highlighted the community-based and participatory focus of the Fund, which is less common with other funding streams.

4.2 Effectiveness of Newton Fund activities

Research collaborations on topics relevant to economic development in Jordan

The project was able to bring together a wide range of stakeholders from the museum and education sectors, with 48 participants in the focus groups. Interviewees noted the project was exceptional in bringing together such a diverse set of cultural heritage professionals.

The project also provided a rich set of data and other material to draw upon for further research and publications. At the time of preparing this case study, the researchers from Durham University and the Hashemite University were collaborating to produce two academic papers. They also presented a joint paper in Helsinki in 2019 and are awaiting the publication of a book based on the project. They have also applied to the Newton Prize and have been shortlisted among several other Jordanian projects.

The data also informed a guidance document on museum best practice that will be disseminated within the cultural heritage sector as well as among policymakers.

Improved capacity of researchers

This project was beneficial to both the UK and Jordanian researcher, providing a valuable opportunity for hands-on applied research to complement theoretical experience in museum and heritage studies on the UK side.

Participants spoke about the value of this equal partnership, which they characterised in terms of knowledge exchange rather than knowledge transfer. The Durham University Museums Learning and Engagement Team⁴¹ also benefitted from working with professionals from a different cultural context, adding to their international collaboration portfolio.

On the Jordanian side, the project also offered a valuable opportunity for international exposure. For female researchers, the project was also beneficial in providing entry points to meet and network with other women carrying out research and working in this field. The Hashemite University students involved in some activities also benefitted from this practical, hands-on research experience.

New opportunities for collaboration within Jordan

The project successfully established an inclusive network for discussion and collaboration which has developed into an informal and inclusive network of professionals representing the museum and heritage sector in Jordan. Through this, museum staff have continued to build on the relationships formed during the training programme, visiting other museums and heritage sites and exchanging knowledge and experience. This new platform for dialogue and collaboration has the potential to continue beyond the lifetime of the project.

New opportunities for collaboration between the UK and Jordan

The project also led to opportunities for collaboration between other project partners. For instance, the Citadel Museum in Amman and Oriental Museum in Durham are planning to establish a partnership.

⁴¹Durham University (n.d.). Available at: <https://www.dur.ac.uk/4schools/#:~:text=The%20Learning%20and%20Engagement%20Team,Art%20Collection%20and%20Durham%20Castle.>

4.3 Emerging signs of impact

Potential impact on economic development

The project directly improved museum officers' capacity and contributed to improving local museum practice across Jordan. Museum officers were trained on issues such as designing a mission statement, how to engage with different audiences, how to engage with communities, how to communicate with children, customer care, and how to promote museum activities, among other issues. The training included a wide and representative sample of museum professionals: 45 participants attended from 20 cultural institutions all over Jordan. Participant feedback collected as part of the post-training assessment further confirmed the training's usefulness and success in improving museum staff's capacity.

Three months after the training, several museums confirmed that trainees had implemented some changes in their museums based on what they had learnt. For instance, a representative of the Jordan museum reported: *"I noticed some of them [the trainees] started with a new way of thinking (how education and learning is important to our museum) ... I think we started with a solid base to establish a new culture for the Jordanian museums to be centres for education, culture and learning."*⁴² Participants have also acknowledged the gap between public museums and private independent museums and have called for establishing a Jordanian Museums Association.⁴³

There are indications that the project has started to create some appetite among youth and encourage their active engagement with cultural heritage. Although no data was collected among the recipients of the museum education material (youth and school children), there are reports that a number of students at the Hashemite University have started to apply for further degrees in cultural heritage at Durham University as a result of their participation in the project.

Signs of sustainability

Longer-term impacts

There is evidence the project was designed so that impacts would be sustained over time. By making cultural heritage more accessible to youth in Jordan and creating awareness among the public, this project can help change mentality and perspectives around the role of museums in society. Building partnerships within the museum sector in Jordan also ensures that conditions are created for knowledge exchange and capacity building to continue.

Barriers to sustainability

It is expected that more efforts will be needed to achieve the project's intended long-term impact, which requires ongoing government support. The museum sector (especially state-run museums) is underfunded in Jordan. Stronger government support is needed to address that challenge and ensure that this project's results ultimately lead to institutionalising museum education in the broader education system in Jordan. It is also notable that Jordan's museums would also benefit from investment in infrastructure e.g. equipment and facilities, and that future impact is partially dependent on this.

However, as a result of the project, museum staff are starting to discuss how to influence the content of new Jordanian heritage legislation and the need for new, targeted, state funding in

⁴² Year 1 Report, The AHRC/Newton-Khalidi Funded Research Project: 'Learning from Multicultural Amman: Engaging Jordan's Youth'.

⁴³ Ibid.

museum education, thereby creating more awareness in the museum sector and broad-based support for policy changes.

Complementarity and coordination

Leadership effects

Policy coordination and influence of this project have been limited to date and will require further efforts, as discussed above. One of the project's objectives was to create and disseminate guidelines on museum education and use these to carry out awareness-raising among policymakers on the educational benefits of museums. These guidelines are currently in development, and there are indications that the project is engaging the right government stakeholders who could facilitate effective policy coordination.

4.4 Conclusions

- **The project simultaneously responds to the country's priority to invest in young people through education**, and harness their potential for development, and to further develop and support the tourism industry in Jordan (as public awareness is thought to be key to its protection).
- **The bottom-up approach used to inform research and other project activities worked well** and ensured that all project outputs and outcomes were relevant to the participants and their respective institutions and reflective of the wider heritage sector's challenges.
- **The project benefitted a range of stakeholders**, including UK and Jordanian researchers, privately owned and state-owned museums, UK and Jordanian museum and heritage professionals, universities, schools, and government agencies across Jordan.
- **There are signs of emerging impact**, including building the capacity of museum officers and museums, contributing to the improvement of local museum practice across Jordan and upskilling and empowering the workforce.

Lessons learned

- Creating partnerships within the museum sector in Jordan helped stimulate the potential for knowledge exchange and capacity building to continue beyond the end of the project, thereby contributing to the sustainability of project outcomes.
- There are indications that the project and sustainability of its results would have benefitted from investment in a combination of human capacity and infrastructure development, to ensure a more integrated capacity building approach and increase sustainability beyond what can be expected from initiatives focusing on human capacity alone.

5 Project: UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security

Summary

Project title	
UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security	
Call title	Researcher Links Workshop
Short description	The workshop brought together UK and Jordanian experts with interdisciplinary early-career researchers to stimulate new research collaborations at the intersection of geosciences and development, natural flood management, catchment science, conservation, and water resource engineering.
Objective(s)	<p>The project aimed to:</p> <ul style="list-style-type: none"> • identify and propose solutions to the problem of high sedimentation rates in existing water harvesting/artificial recharge schemes in Jordan, with a focus on the Al-Wala Dam near Madaba. • identify the impacts of major UN-funded ecological restoration projects in the Jordanian Badia desert on groundwater and sediment dynamics. • critically assess the potential scale and sustainability of water harvesting and groundwater recharge within the national water supply budget. • develop a roadmap for research and knowledge exchange.
Pillar	People
Acton value (total budget allocated in country, in GBP)	<p>£16,225 (UK)</p> <p>Travel and subsistence support, provision of workshop venue and access to other facilities by Mutah University (Jordan)</p>

Start / end date (Status: on-going or complete)	23 – 25 April 2019 (Status: Completed)
DP UK and overseas	British Council (UK) and Ministry of Higher Education and Scientific Research (Jordan)
Award holders/ grantees	Sheffield Hallam University and Mutah University

Description of the project

The UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security project was part of the British Council’s Researcher Links Workshop call. This aims to:

- build links for future collaboration between researchers through establishing new and strengthening existing research links.
- improve researchers’ career opportunities, including building the capacity of early career researchers.
- support international development goals.

The thematic focus of the project was the intersection of geosciences and development, natural flood management, catchment science, conservation and water resource engineering. The workshop took place in Kerak, in Jordan in April 2019.

The partners for this workshop included the British Council (UK), Ministry of Higher Education, Science and Technology (Jordan), Sheffield Hallam University (UK) and Mutah University (Jordan). The workshop involved various other stakeholders, including the Ministry of Water and Irrigation, water management organisations and other water authorities, and experts in the field from different UK and Jordan universities.

Pathway to impact

This project fits well within the Newton Fund’s Theory of Change for People pillar projects, as presented in Annex 4, Figure 4. However, the project has broader coverage with outputs and outcomes under the Research pillar and Translation pillars.

Activities: The workshop and associated activities aimed to provide participants with on the ground experience and real-life case studies, before bringing them together for collective brainstorming on how innovative applied research could address water challenges in Jordan. Activities included seminars and site visits to Al-Wala Madaba catchments and the Badia Desert.

Outputs:

- the four-day workshop itself, including networking opportunities.
- a roadmap for future research and knowledge exchange on the issues discussed.
- ideas for research projects to address water management challenges in Jordan.

- A website with a research library, shared Dropbox page with material from the workshop, a collaborative space for working and sharing, accompanied by a WhatsApp group for informal contact and networking between participants.

Outcomes: short term outcomes include

- an agenda for future collaboration among all participants and partners, based on the roadmap.
- new research projects and collaborations among workshop participants and institutions.
- human capacity development, in the form of improved skills and network development for early career researchers.
- institutional capacity development, in the form of new national and international research networks, enabling Jordanian and UK research institutions to apply technical expertise in a new context and access new funding opportunities.

Anticipated **longer-term outcomes** include:

- gathering of new evidence on water management in Jordan and the specific desert context.
- governments incorporate new evidence in water management.
- peaceful regional cooperation in water resource management as a result of improved understanding and capacity.

Expected impact

- decision-makers make better decisions on water management.
- water ministries and dam management authorities design cost-effective, efficient water storage and management infrastructure.
- new investment is made in sustainable agriculture and conservation through better understanding of technical solutions and their costs and benefits.
- greater water security for both rural communities and urban populations.

5.1 Emerging project results

Relevance of Newton Fund activities

Relevance to country development and ODA priorities

The project was highly relevant to Jordan's development needs and the UK's ODA priorities. Addressing Jordan's water crisis is in line with the Newton Fund's priorities for Jordan, particularly Priority 2 (Water Management) and to a lesser extent Priority 3 (Agri-tech and Food Security). The country is one of the most water-stressed in the world. Besides having to share resources with neighbours including Saudi Arabia, Israel, Iraq and Syria, the Syrian refugee crisis has further burdened Jordan's water economy.⁴⁴ The workshop was designed to focus on innovative and sustainable solutions to these challenges, making it highly relevant to Jordan's partners.

⁴⁴ 'UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security' submitted proposal, 2018.

Additionality

The project built on a pre-existing link and previous research collaboration (PhD thesis and major publication) between the UK and Jordanian AHs. **Nonetheless, there is good evidence that the project would not have happened without the Newton Fund.** In particular, the Fund was described as the only funding mechanism with a strong focus on creating links and connections between researchers and supporting early career researchers. Another distinctive feature mentioned by respondents was the focus on very specific development issues and the emphasis on nurturing nascent collaborations rather than long-established ones.

5.2 Effectiveness of Newton Fund activities

Capacity building for UK and Jordan institutions in research and innovation

The workshop **provided good capacity building opportunities for researchers and research institutions in the UK and Jordan** and opportunities for further collaborations. Sheffield Hallam, benefitted from an opportunity to broaden and improve technical expertise with knowledge and experience of water security and management in a very different context to that of the UK, and create more national and international funding opportunities on these topics. This was very valuable in light of the AH's strategy to undertaken more international applied research.

For Mutah University, project activities were a valuable opportunity to build national and international contacts and networks within academia and the water sector. Both institutions benefitted from more national and international visibility, profile-raising activities, and the possibility for further research on the topics identified through the workshop.

Capacity building of UK and Jordan researchers in research and innovation

UK researchers benefitted from the case study materials and other data for further research generated through the workshop. The workshop also helped enrich their experience by providing first-hand experience of the Jordanian context.

Researchers on both sides benefitted from combining international geoscience expertise and detailed local and regional knowledge and networks, spurring innovative thinking and enriching their knowledge. They further benefited from identifying key themes and research priorities as part of the workshop, which provided them with a range of potential research topics to pursue.

The network created as part of the workshop also gives access to various collaborators, potentially enabling further research. At the time of reporting, there were plans to publish a research paper based on discussions from the workshop. However, there has been limited opportunity to progress these due to the outbreak of the COVID-19 pandemic.

Opportunities for early career researchers

The workshop included early career researchers who gained from the valuable opportunity to network, collaborate and exchange ideas with technical experts from various institutions and different disciplines and learn from more established researchers' experience. There is evidence that this has continued after the project, for instance the WhatsApp group is frequently used for informal networking.

However, there are indications that the Newton Fund may not always enable early career researchers to achieve visibility and recognition, despite this being one of the objectives. This is mainly due to the call's application requirements, such as having an established researcher as the

research institution's main representative. This may limit visibility and recognition of the early career researchers involved, thereby lessening the potential impact of the collaboration in building their international connections.

Opportunities for further research and collaborations

At the time of reporting, researchers were collaborating on a proposal for a spin-off project on a relevant topic (smart irrigation), based on key areas identified through the workshop, which is being pursued through the Newton Fund's Newton Prize.⁴⁵ There are also plans to further diversify this relationship through student and staff exchange programmes under ERASMUS+.

The workshop led to various new ideas for collaboration and three project outlines, with projects leads, responsible for further developing these ideas appointed during the workshop. **Two of these project ideas, on smart irrigation and on flash flooding, have been taken forward and have applied for funding.** One represents a continued research collaboration between the Sheffield Hallam and Mutah and the other a new research collaboration between Mutah and another institution that participated in the workshop.

5.3 Emerging signs of impact

Potential to contribute to poverty reduction and economic development

Given the nature of the workshop and the long-term nature of the impact objectives described above, it is **unlikely that any of these changes will be observed in the short-term and without additional funding** to pursue plans for further research. However, there are some limited emerging signs of impact that have the potential to contribute to these changes, including an increased awareness of the importance of research in this field. Despite the imminence of the water crisis, water management is an understudied topic in Jordan. As a result, there is little innovation in the area and little awareness in Jordanian society of how to address these challenges. By engaging a broad set of stakeholders, raising the visibility of existing research, and disseminating its outputs and outcomes, **the workshop was able to work towards putting the topic of water security on the agenda.**

Signs of sustainability

Longer-term impacts

Much of the project was designed with sustainability in mind. The workshop created links and encouraged research projects and other future collaborations between researchers and other key stakeholders in the field. It also resulted in a roadmap and an agenda for research and knowledge exchange and future project ideas, providing a strong basis for future bilateral Jordan-UK collaboration. For this reason, the project's results are expected to be sustainable. The sustained interaction between participants, well beyond the project's lifetime, and the two project ideas that have progressed into project proposals, are further signs that longer-term collaboration is likely.

However, respondents highlighted that a different allocation of the funding could have further increased sustainability. At present, funding is only allocated to the main workshop event, and not to potential follow up activities. Several participants said a component of the funding could usefully be earmarked as seed-funding for potential project ideas stemming from the main event to

⁴⁵ At the time of reporting, the researchers were yet awaiting 'outcome of their application for the project 'Establishing a Newton-Khalidi Smart Agriculture Technology Centre in the central Jordan Rift Valley'.

increase sustainability. This would also help consolidate of any new relationships built because of the workshop.

Complementarity and coordination

Policy coordination and influence of this project have been limited to date and will require further work. Among the workshop's long-term aims are generating new data through further and relevant research to support water management organisations. Policy coordination and influence will be contingent on achieving those aims, which will take more time.

5.4 Conclusions

- The workshop stimulated new and innovative research collaborations, including identifying and prioritising key themes for further research. It developed a roadmap for research and knowledge exchange and future project ideas that could address Jordan's water management and security challenges. This also led to the development of two new projects, on smart irrigation and flash flooding, and new collaborations between participants of the workshop.

Lessons Learned

- Although the early career researchers involved in the workshop benefitted from its capacity building, networking and knowledge exchange opportunities, **there are indications that opportunities for visibility and recognition were limited**, despite this being one of the call's objectives. Future initiatives of this kind could build in measures to address this.
- Although there are signs that the project's results will continue past its lifetime, **key resources to enable further collaborations were not available**. At present, funding for projects under the Researcher Links Workshop is only allocated to the main workshop event, not to potential follow up activities. Earmarking some funding for potential project ideas stemming from the main event could ensure more sustainability, including consolidating new relationships and pursuing further collaborations.

6 Project: UK-Jordan Educational and Research Partnership to Build the Capacity of the Power Grid to Integrate Solar PV Systems

Summary

Project title	UK-Jordan Educational and Research Partnership to Build the Capacity of the Power Grid to Integrate Solar PV Systems
Call title	Industry-Academia Partnerships Programme
Short description	The project will employ smart meter data to improve the operation of solar distribution networks, while improving the practical engineering skills of graduates at the University of Jordan.
Objective(s)	<p>The project aimed to:</p> <ul style="list-style-type: none"> • harness expertise from Cardiff University and Jordan’s Electricity Distribution Company (EDCO) to help academics from the University of Jordan design courses in renewables and smart grid management, following best practice from the UK. • improve learning outcomes for engineering students and inspire them to develop innovative solutions. • build research capacity at the University of Jordan, allowing it to undertake industrial research and play a key role in the transition towards a low-carbon energy system in Jordan. • establish long-term research collaboration between UK and Jordanian academics to solve challenges resulting from the connection of low-carbon technologies to the grid.
Pillar	Translation
Acton value (total budget allocated in country, in GBP)	<p>£40,555 (UK)</p> <p>£3,000 and in-kind support from EDCO and University of Jordan (Jordan)</p>

Start/end date (Status: on-going or complete)	March 2018 to 30 September 2020 ⁴⁶ (status: ongoing, due to COVID-related delays)
DP UK and overseas	Royal Academy of Engineering (UK) and Industrial Research and Development Fund (Jordan)
Award holders/ grantees	Cardiff University and the University of Jordan

Description of the project

Brief description of the project

Project partners include the Royal Academy of Engineering (UK) and the Industrial Research and Development Fund (Jordan), Cardiff University and the University of Jordan as well as an industry partner in Jordan – the Electricity Distribution Company (EDCO).

Currently, 90% of the electricity in Jordan comes from outside sources. Historically the country's main energy source was oil. However, oil prices increased significantly following the Arab Spring, making import reliance costly and underlining the need to develop renewable energy sources. The country has nonetheless experienced several difficulties in storing renewable energy on the grid.

Against this background, the project aims to improve learning outcomes for engineering students by supporting the design of university courses based on best-practice from the UK in grid management, build capacity at the University of Jordan to undertake industrial research, and build the capacity at EDCO by establishing long-term research collaborations with the UK.

Pathway to impact

This project fits well within the Newton Fund's Theory of Change for Translation pillar projects, as presented in Annex 4, Figure 5. The project also includes outputs and outcomes relevant to the Research pillar and People pillar to the extent that it creates links between industry and academia and increases the capacity of researchers and research institutions.

Activities:

- a month-long visit by the Jordanian researcher to the UK research institution to learn from UK best practice in teaching.
- additional exchange visits between the UK and Jordanian researchers.
- support from Cardiff University to help build capacity and improve university courses.
- engagement with EDCO to obtain real-time grid data.
- several workshops and training events.

Expected outputs:

⁴⁶ The end date may be extended as a result of COVID-19 delays

- design of university courses on renewable energy and smart grids, based on UK teaching examples.
- generation of knowledge based on the project's findings, disseminated in short courses and workshops.
- development of products or ideas for commercialisation and other planning tools to help overcome industry challenges.
- Production of industry-oriented research papers and reports.

Expected outcomes:

- improved teacher capacity and improved learning outcomes including stronger practical engineering skills among engineering graduates.
- further research collaborations that can support industry needs and creation of more opportunities for funding.
- improved knowledge and expertise of EDCO staff on smart grid technologies and planning tools.
- improved capacity for the University of Jordan to contribute to energy policy.

Expected impact:

- help solve real industry challenges and improve energy policies for the transition to a low-carbon energy system, enabling more efficient use of solar energy in Jordan and stronger economic development.
- greater employability of graduates.

6.1 Emerging project results

Relevance of Newton Fund activities

Relevance to country and ODA priorities

The responds to Jordan's priorities in addressing energy constraints outlined in its National Development Plan and is also aligned with the Newton – Khalidi Fund's 2017-21 priorities for Jordan, particularly Priority 1 (Energy). It will also directly help Jordan to address complex challenges, including scarce resources, stresses on energy sources, and fiscal difficulties all of which are compounded by the Syrian refugee crisis and the country's geo-politically sensitive location.

Additionality

There is evidence that the project had high levels of additionality and would not have happened without the Newton Fund. Respondents described the Newton Fund as the only funding mechanism with a strong focus on creating links, supporting early career researchers, and connecting applicants to expertise to enhance their potential to make a real impact. Other beneficial and distinctive features mentioned by respondents focus on encouraging international collaboration and the effectiveness of seed funding.

6.2 Effectiveness of Newton Fund activities

Collaborative solutions to industry challenges

The project has developed several models and planning tools to improve EDCO's operations and planning based on real-time data provided by the company, thereby ensuring they are relevant and more likely to be effective. The models are general enough to be applied elsewhere and therefore have the potential to benefit other electricity distributors both locally and globally. Policy recommendations for improving energy policy at the national level were also developed and could benefit the national industry if adopted by the government.

There are indications the industry partner also benefitted from exposure to international expertise through attendance of conferences where industry and academia were brought together. The models and tools designed for the industry partner have improved the capacity and knowledge of individual staff members at EDCO.

Another project output is the development of a smart socket to control home appliances on a remote basis and monitor the power consumption of households. The smart socket was developed in cooperation with engineering students at the University of Jordan and has the potential to be commercialised in the future.

Opportunities for further collaboration and innovation

The UK and Jordanian researchers published three research and conference papers⁴⁷ and participated in several workshops and seminars, including;

- a virtual seminar to the CIRGES group (an energy and power systems research group at Cardiff University).
- the Low Carbon Networks Fund conference in October 2019 in Glasgow, which brings together industry and academia from across the world – EDCO also attended.
- the Water Energy Nexus conference (organised by the project), held in collaboration with the German Agency for International Cooperation (GIZ) and the German Academic Exchange Service.⁴⁸ This was attended by delegates from universities, industry, Jordanian electricity companies, water and energy experts and other high ranking Jordanian officials.

The engagement of internationally recognised experts from UK research institutions in different events, workshops and discussions in Jordan is also improving possibilities for future projects that aim to solve challenges in the Jordanian electricity industry.

Capacity building of UK researchers

Early career UK researchers benefitted from the valuable opportunity to take a leading role and engage in all aspects of project design and implementation, including project management. They also benefitted from international recognition of their work on the project, including journal publications, and new opportunities for future collaborations and further research.

⁴⁷ Alnaser, Sereen Althaher, Chao Long, Reem Hamdan, "Integrating flexibility from photovoltaic and residential batteries in distribution networks: Jordan Case Study", submitted to CIRED 2020 Conference (under review); Sahban Alnaser, Sereen Althaher, Chao Long, Yue Zhou, Jianzhong Wu, "Residential Community with PV and Batteries: Reserve Provision under Grid Constraints", submitted to the International Journal of Electrical Power and Energy Systems (accepted with minor revision, in the second round of review); Sahban Alnaser, Sereen Althaher, "Grid Impact Analysis and Smart-Grid Control Strategies for PV-Rich Distribution Networks" presented at CIGRE-Jordan conference, Amman, Jordan, 2018.

⁴⁸ EGREEN (2019) EGREEN participates in the Water-Energy Nexus Conference. Available at: http://sites.ju.edu.jo/en/egreen/Lists/Events/Disp_Form.aspx?ID=74 (Accessed: 12/02/21)

At the time of reporting, **there were several plans to expand this collaboration further**. Other than clear capacity development benefits, the collaboration also expanded early career researchers' horizons and widened their thinking by providing an opportunity for practical experience in a different context.

The project also **enabled participating UK researchers to establish a strong relationship** with the Jordanian researcher, thereby enhancing future international collaborations opportunities. For instance, the Jordanian and UK researchers have collaborated on a new proposal for a spin-off project, 'UK-Jordan Partnership to Leverage Smart Meter Data Analytics in Power Distribution Industry for Solar PV Integration and Energy Losses Estimation', which builds on findings from this project.

Capacity building of Jordanian researchers

Other benefits include **improved knowledge and capacity of the main AH**, research institution and engineering students on the Jordanian side. The AH's month-long visit to the UK research institution helped establish strong connections between researchers and also allowed the researcher to gain valuable experience. The visit allowed for participation in teaching courses, access to leading expertise, knowledge on UK practice in industry-oriented engineering courses and the transfer knowledge to both academic and industry communities.

Other benefits observed include improved skills, such as proposal writing and networking. The visibility and recognition received because of the project have been valuable in terms of career development and creating pathways to collaboration with other researchers and industry actors.

Benefits to Jordanian research institution and engineering students

The University of Jordan and its engineering students benefitted primarily from the upgraded and newly developed courses following UK examples and based on real data, including an industry-oriented MSc course on renewable energy. The active engagement of students in workshops and developing solutions, including in the smart socket design, enriched their practical skills.

Access to real data and engagement with industry further enhanced their learning opportunities. At the time of reporting, there were several plans to expand this collaboration, including a training event specifically designed for students. This 'Grid Integration of Renewable Energy Systems Workshop' was due to take place in March 2020 but rescheduled to take place online later due to COVID-19.

6.3 Emerging signs of impact

The project seeks to solve real industry challenges and improve energy policies, encourage more efficient use of renewable energy in Jordan, improve the employability of graduates, and contribute to economic development. It is unlikely that any of these changes will be observed in the short-term. However, there are indications the project will provide a positive contribution over time. For example, the creation and improvement of links between industry and academia are already leading to innovative solutions.

The project is also directly contributing to **improving engineering graduates' employability** by enhancing their learning opportunities and learning outcomes. The courses developed as part of the project were designed to ensure they follow UK best examples, and align with Jordanian industry needs and problems, making students' knowledge and skillsets more relevant to their context.

The project is also **transferring knowledge to academic and industry communities in Jordan** by disseminating researchers' knowledge and experience in this technical area. Representatives from various universities and industry across Jordan were invited to the Water Energy Nexus conference already mentioned. As a result, the project benefits a much wider audience than just those directly involved.

Signs of sustainability

Longer-term impacts

Most of the project's activities were designed to promote sustainable outcomes. For instance, through establishing strong links between industry and academia, encouraging applied research and innovation, and building the capacity of young engineers. Through collaboration on this project, UK researchers were also able to establish a strong relationship with the Jordanian AH, enhancing opportunities for future international collaborations. Considering the sustained engagement between the researchers and the collaboration on a new proposal, it is likely that this will continue beyond the project's lifetime.

Complementarity and coordination

Leadership effects

At the time of reporting, there are limited signs of policy coordination and influence.

Although the project itself is too small to have a considerable impact on energy policies, it has managed to engage decision-makers in key discussions and demonstrated the value of academia-industry collaboration and the potential of research to solve industry challenges. The project also has the potential to encourage more innovation and applied research, which in turn may lead to changes in policy and practice.

6.4 Conclusions

- **This project responds to key development challenges in Jordan**, relating to: i) the integration of renewable energy within existing energy distribution networks; ii) capacity building needs for engineering graduates and researchers; iii) the need to create better links between industry and academia; and iv) appetite to develop a culture conducive to entrepreneurship.
- **There are some signs of emerging impact.** The project has created links between industry and academia to collaborate on innovative solutions to existing and future industry challenges. The project has also enhanced students' knowledge and experience through courses and active engagement in project activities and has started to transfer knowledge to academic and industry communities in Jordan.
- **The project has managed to engage the interest of decision-makers and has demonstrated the value of academia-industry collaboration in this field.** However, beyond encouraging uptake of the policy recommendations developed, there are no further plans to engage policymakers going forward.

Lessons Learned

- **Applying real industry data to develop solutions to industry problems worked well** and helps create innovative solutions. Using data provided by the industry partner, the researchers designed models and tools to improve the industry partner's practice, recommend innovative

solutions and develop policy recommendations for improving energy policy at the national level.

- **The project's multi-pronged approach benefitted a wide range of stakeholders**, including UK and Jordanian researchers and research institutions, Jordanian engineering students, and the industry partner, increasing its relevance and potential on the ground applications. However, additional efforts will be needed to influence future policies in this area.

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 Jordan's research and development context. Documents reviewed include the evaluation's Jordan Baseline and Endline Reports, Mid-Term Thematic Impact Report, and the updated Country Situation Note. We also conducted a literature review of additional documentation the Jordan's science and innovation landscape. 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 Jordan and the UK** in July and August 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 – Fieldwork Sample Brief: Final Evaluation of the Newton Fund

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 three additional countries (Jordan, Kenya and Peru)⁴⁹ due to the Newton Fund's expanded scope. Six of these countries were included in the Mid-Term Evaluation (MTE)⁵⁰ of the Newton Fund case study research.⁵¹

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)⁵² 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 six projects analysed as part of the MTE.

⁴⁹Jordan, 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.

⁵⁰ Mid-Term Evaluation of Newton Fund (2018). Accessible [here](#).

⁵¹ 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.

⁵² The BEIS ‘Activity Tracker’ is an Excel-based internal monitoring tool by BEIS and updated quarterly by the UK Delivery Partners.

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.

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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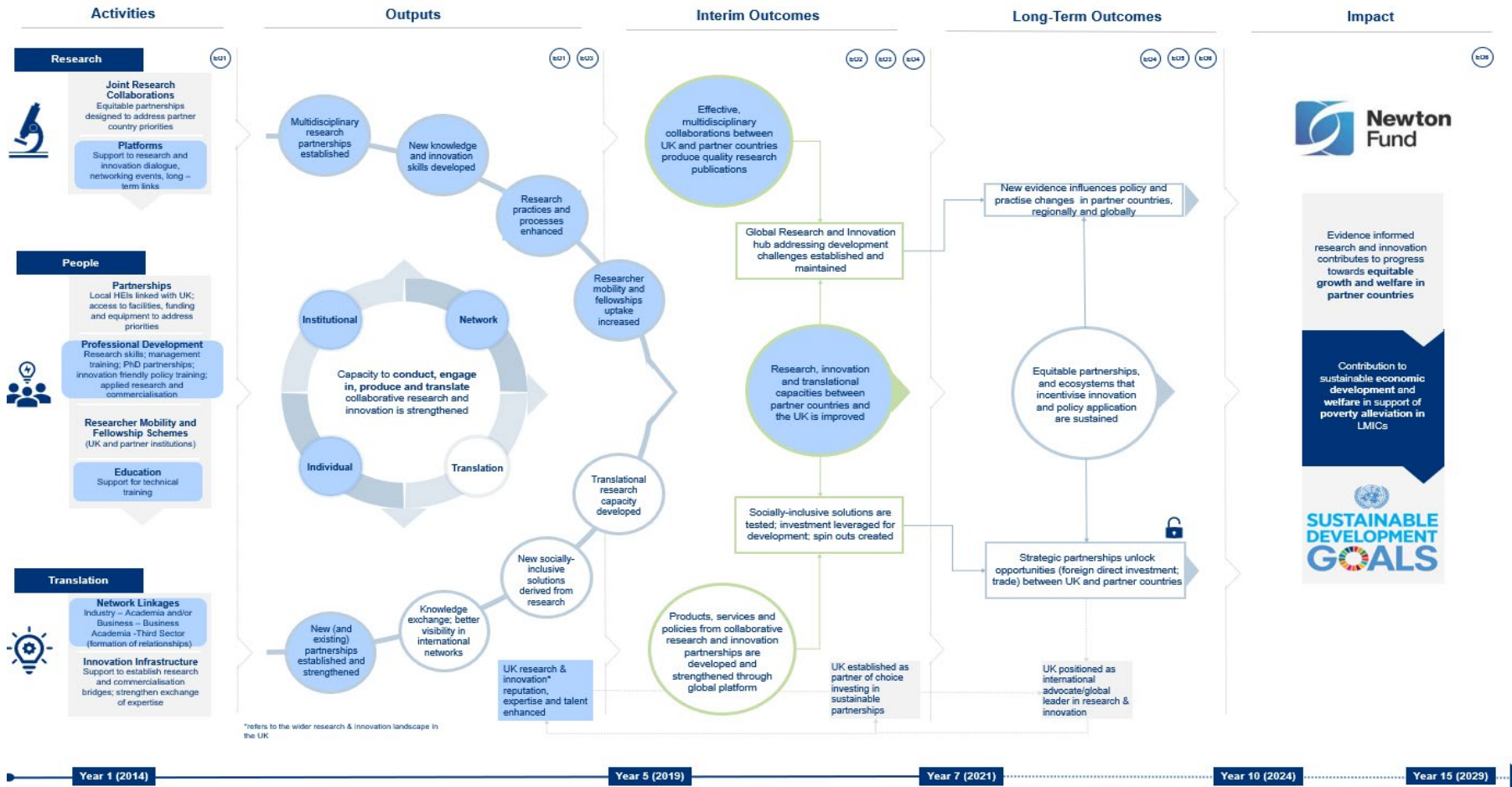
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Annex 4 – Theories of Change per Action⁵³

Figure 3: Learning from Multicultural Amman: Engaging Jordan's Youth



⁵³The 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 4: UK-Jordan Joint Workshop on Sustainable Catchment Management and Water Security

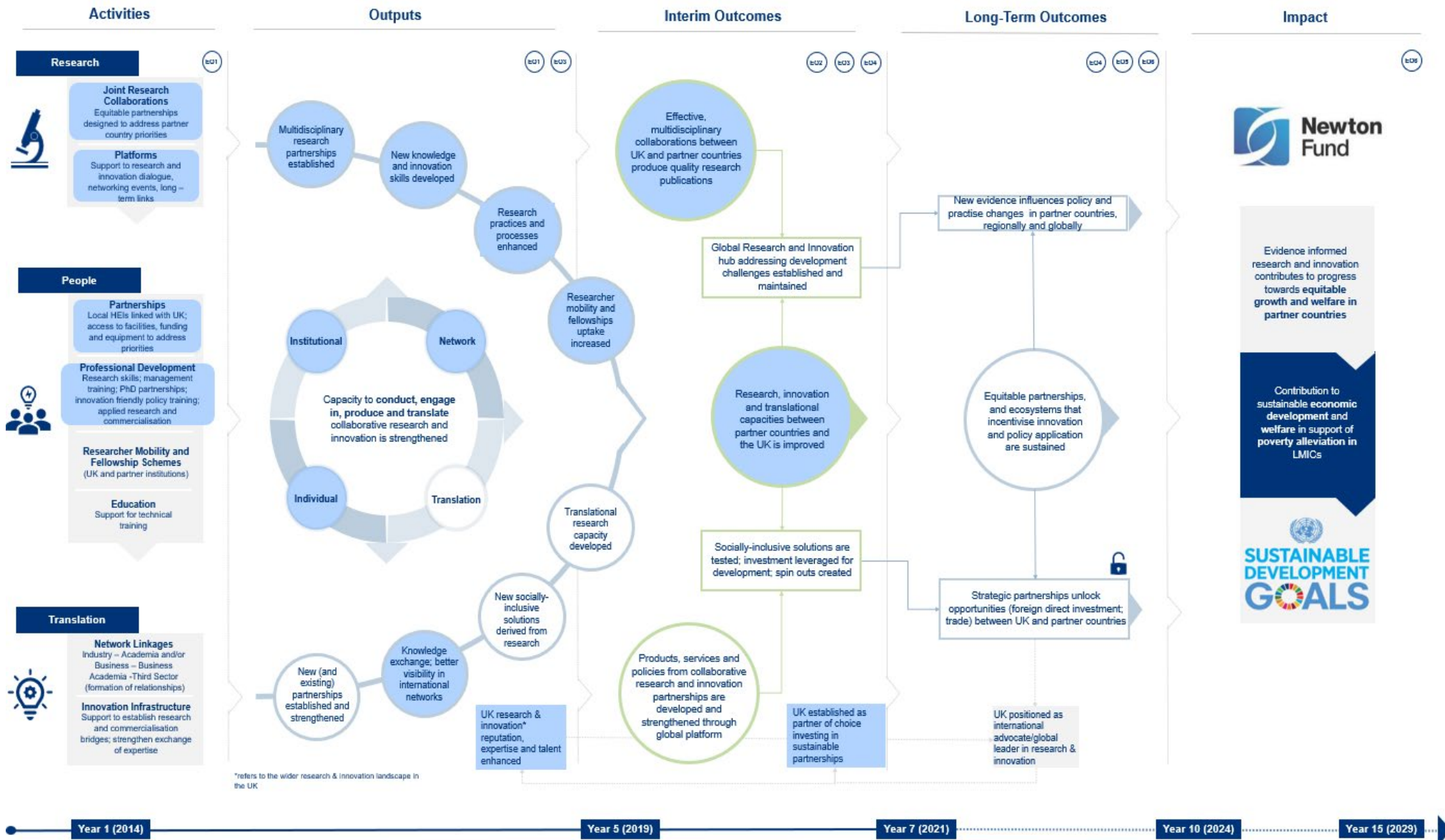
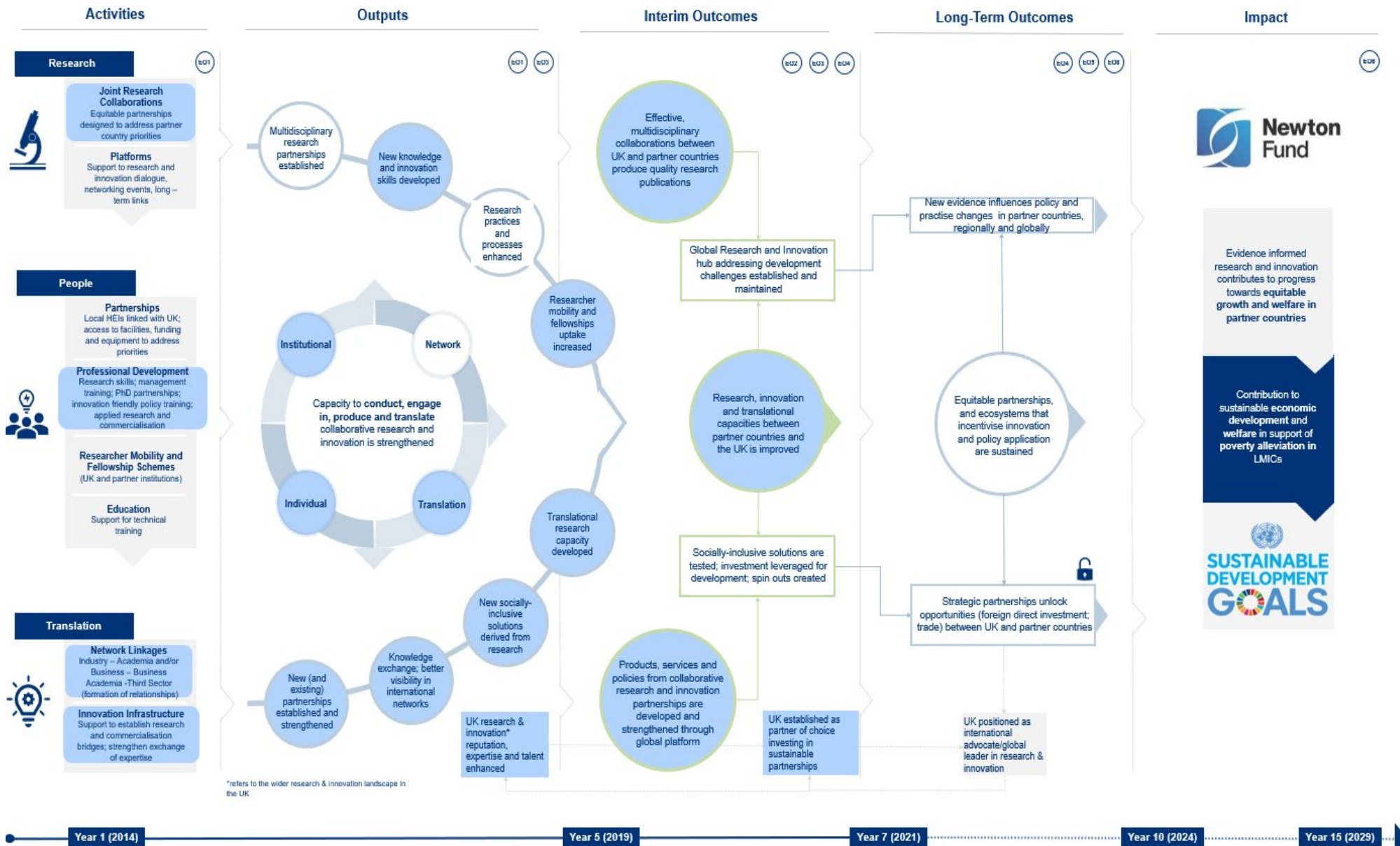


Figure 5: UK-Jordan Educational and Research Partnership to Build Capacity of Power Grid to Integrate Solar PV



This publication is available from: www.gov.uk/government/publications/newton-fund-final-evaluation-and-supporting-evidence

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