DAERA Innovation Strategy
2020-2025

An innovation ecosystem delivering for the environment, society and the rural economy.

Public Consultation
January 2020

A living, working, active landscape valued by everyone.

Department of
Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

INVESTORS IN PEOPLE

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DAERA - Innovation Strategy - Our Mission
An innovation ecosystem delivering for the environment, society and the rural economy.

Create an Innovative Culture

Provide Effective Leadership

Enable Connectivity

Contents

SECTION 1

1. Preface

The Department of Agriculture, Environment and Rural Affairs (DAERA) has a vision for a living, working, active landscape valued by everyone. It is a science based, data driven department, which invests around a quarter of its annual budget on science services. These services involve monitoring and surveillance testing and research and development (R&D). Science outputs are used to inform policy development, meet statutory obligations, measure outcomes, provide advice and information, mange risks to society and the environment, support rural affairs and promote innovation. In the context of the UK leaving the EU, the importance of the science evidence DAERA uses and provides is increased.

DAERA is currently implementing a Science Transformation Programme. This programme aims to ensure that the science DAERA secures and uses is innovative, collaborative and transformative and will support a healthy and sustainable economy, environment and rural community, including delivering on Programme for Government (PfG) outcomes.

As part of the Science Transformation Programme the high level DAERA Science Strategy Framework has been established. This will guide how DAERA can optimise its use of science to help deliver Departmental and PfG objectives. This Innovation Strategy (alongside Monitoring and Surveillance and R&D operational strategies), derives from the Science Strategy Framework and is integral to its implementation.

Innovation is '*the successful generation and exploitation of new ideas. It is about transforming creative thinking into new products, new and improved processes and technologies to support new ways of doing business'*[1]. In many cases, it relates to the novel use or application of knowledge or information we have, to yield products or outcomes of enhanced economic, social or natural capital value.

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[1] Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025

DAERA's strategic drivers provide a context for a significant focus on encouraging and supporting innovation by the Department and in agri-food, environment, marine and fisheries, forestry and rural communities to achieve economic, environmental and social benefits across the breadth of DAERA's remit.

Purpose of this document

This consultation exercise gives you the opportunity to articulate your views on whether you consider the proposed DAERA Innovation Strategy to be relevant and appropriate from your organisation's or your sector's perspective, as a means of driving innovation and delivering better outcomes. This exercise will inform the direction of the Innovation Strategy and the Department encourages you to share your views with us.

SECTION 2

2. Introduction

2.1 There is a compelling rationale for government to invest in establishing and encouraging an environment conducive to innovation. Evidence shows that businesses that innovate grow nearly twice as quickly in both employment and turnover[2] as non innovators. Innovation drives research and development which in turn leads to economic growth[3].

2.2 Society is facing many challenges and innovations can help transform how we live and work. The scale of human impact on the planet has never been greater and innovative solutions are needed to address the wide range of threats to our future health and well being. It is predicted that 60% more food will be needed worldwide by 2050 to feed the increasing global population[4]. To do this we need to find innovative, resilient and sustainable ways to produce food more efficiently and with a lower environmental footprint.

2.3 Many global challenges, including climate change, land and ecosystem degradation and waste management, are threatening our environment. At a local level, environmental challenges are highlighted in the DAERA Environmental Strategy for Northern Ireland Public Consultation document and include (but are not confined to) the management of waste and development of a circular economy, waste crime, air quality, local environmental quality, biodiversity loss and soil quality. In addition there are challenges that exist in reconciling agricultural activities and environmental consequences, particularly in areas such as greenhouse gas emissions, the effect of run off of nitrogen and phosphorous on water quality and the impact of ammonia emissions on designated sites and priority species.

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[2] NESTA, 'The Vital 6%' (2009)
[3] Economy 2030 - Draft Industrial Strategy for Northern Ireland (DfE) (2017)
[4] UKRI, Transforming Food Production (2019)

2.4   Northern Ireland has been the lowest or next to lowest in the UK regions innovation rankings for many years (Fig 1[5] and Annex 1) with many barriers to innovation cited[6] including availability and cost of finance, lack of leadership, technological, R&D and creative thinking skills, risk aversion and lack of understanding of innovation. Northern Ireland is currently the least innovation active region of the UK.

2.5   The ambitious Mission of this strategy is to develop an innovation ecosystem which delivers for the environment, society and rural economy; measured by Northern Ireland becoming the most successful region in the UK at exploiting opportunities in the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy in the sectors within DAERA's remit.

2.6   This strategy outlines the goals and objectives for DAERA to create an enabling environment for innovation to flourish and to enhance the impact of knowledge generation and science investments to help DAERA deliver Departmental and PfG objectives and meet our commitments under the UN Sustainable Development Goals.

2.7   The draft DAERA Innovation Strategy highlights two key priorities to achieve this:

- The creation of an enabling environment within DAERA to support innovation and the implementation of innovation actions within the Department.
- The establishment of an enabling, external environment to encourage and support the implementation of innovation actions by all businesses operating in the sectors for which DAERA has responsibility; and specifically to prioritise innovations relating to Big Data, Artificial Intelligence and a Transformative Bioeconomy. (Details are provided in Section 4).

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[5] UK Innovation Survey 2017: Northern Ireland Results (June 2019)
[6] Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025

Fig 1 Variations in innovation activity by UK country

Innovation active firms by UK country
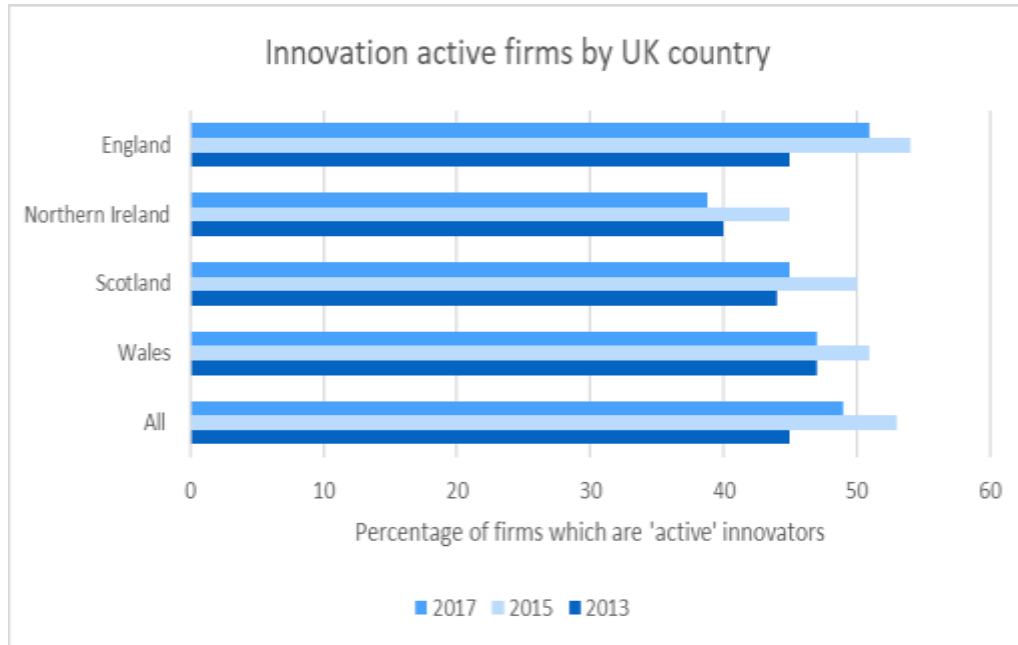
UK Innovation Survey 2019

SECTION 3

3. Strategic Context

The high level strategic context is outlined in the draft DAERA Science Strategy Framework:

https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/daera-science-strategy-framework-V2.PDF

The innovation specific drivers are noted below.

3.1 The Northern Ireland Executive's draft Programme for Government (PfG) 2016 - 2021 outlines priorities to be delivered in NI for the purpose of '*improving wellbeing for all - by tackling disadvantage and driving economic growth'*. This includes a range of priorities relevant to DAERA, including those focused on achieving a strong, competitive, regionally balanced economy (Outcome 1); living and working sustainably - protecting the environment (Outcome 2); enabling the enjoyment of long healthy lives (Outcome 4); becoming an **innovative**, creative society, where people can fulfil their potential (Outcome 5) and creating a place where people want to live and work, to visit and invest (Outcome 10).

3.2 The Northern Ireland Economic Strategy - Priorities for sustainable growth and prosperity (2012), identified **innovation**, R&D and creativity as one of its five strategic themes. The strategy also recognised agri-food as one of the areas in Northern Ireland with greatest potential for sustainable growth.

3.3 Innovate NI **Innovation** Strategy for Northern Ireland 2014 - 2025 takes forward the 'Stimulating **innovation**, research & development and creativity' theme identified in the Northern Ireland Economic Strategy 2012. Innovate NI aims to stimulate a step change in innovation across the economy. This strategy also highlights the fact that skills, design and collaboration between sectors locally, nationally and internationally are essential for innovation.

3.4 The draft Economy 2030 - Industrial Strategy for Northern Ireland (2017), outlines five 'Pillars for Growth' including 'Accelerating **innovation** and research.' The strategy provides priorities under this pillar and identifies agri-food as one of the six broad sectors of the economy where Northern Ireland has world class capabilities.

3.5 As part of its Brexit preparations, DAERA has developed a draft Future Agricultural Policy Framework for Northern Ireland (2018). This recognises that science and **innovation** are important drivers of long term productivity growth. This draft framework notes that whilst there is significant investment in innovation research in Northern Ireland, much more could be achieved both from existing resources and from additional investment.

3.6 DAERA has also initiated Northern Ireland's first Environment Strategy. DAERA recognises the strategic importance of **innovation** in addressing the wider climate change, environmental and social challenges associated with growing and rebalancing the Northern Ireland economy. We need new technologies, radical approaches and solutions across all areas to achieve ambitious Net Zero UK wide emissions reduction targets and to deliver biodiversity, water and air quality objectives.

3.7 A range of other strategies, which address food, agriculture, environmental resources, biodiversity, marine and fisheries, forestry, water, recreation and the rural sector in the UK, Ireland and further afield identify the importance of innovation to delivering solutions to complex issues across environmental, economic and social interfaces. Details of these are provided in the DAERA Science and Innovation Strategies Evidence Base.

Section 3 Question

Q1 What are your views on the strategic context and drivers identified to underpin a DAERA Innovation Strategy?

SECTION 4

4. What is innovation?

4.1 '*Innovation is the successful generation and exploitation of new ideas. It is about transforming creative thinking into new products, new and improved processes and technologies to support new ways of doing business.*' Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025.

Why should government invest in innovation?

4.2 There is a compelling rationale for government to invest in establishing and encouraging an environment conducive to innovation. Innovation enables firms to stay ahead of their competitors. Innovation is much more than R&D. It includes changes to products and processes, introduction of new business models, organisational changes and the exploitation of new markets.

4.3 There is a need for the public sector to innovate. Increased innovation is required within the public sector to enable it to play an effective role in encouraging innovation in private business and the wider community. Publicly funded R&D and innovation activity elicits a higher business response than private sector spending[7]. Publicly funded academic research results in substantial spillovers to private firms, while private sector R&D is almost wholly captured by the original investors. Government needs to be innovative and it needs to create the conditions for innovation. Support from the public sector for innovation is critical to economic growth[8] and to delivering a healthy society and natural environment.

4.4 There are many challenges and changes facing the world we live in. Innovation is needed to help society find solutions. In agriculture a wave of technological innovations is leading to a revolution in practice that is comparable to the one led by widespread mechanisation[9].

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[7] What Works Policy Review, Why Innovation?
[8] Fostering innovation in the public sector, OECD (2017)
[9] Williams &Wootton-Beard, IBERS, Aberystwyth University (2019)

Innovation is also essential in addressing key environmental challenges, including reducing greenhouse gas and ammonia emissions and understanding and adapting to climate change risks and opportunities.

4.5   It is recognised that national governments can stimulate innovation through providing incentives for R&D and innovation; stimulating knowledge exchange and innovation adoption; supporting facilitation activity to encourage/support innovation; and enabling collaboration. The EU Standing Committee on Agricultural Research (SCAR) recommends that governments should have an innovation policy focusing on capacity building, supporting collaboration, mitigating barriers, incentivising innovation actions/investment and dissemination of information as widely and visibly as practical[10].

4.6   Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025[11] recognises that Northern Ireland needs a complete step change in its culture, priority and performance in respect of innovation. The strategy highlights the need for increased innovation within the public sector so it can play an effective role in stimulating innovation.

Barriers to innovation

4.7   Common barriers to innovation in the UK are reported to include affordability, perceived economic risk, regulation, lack of capacity/capability and lack of market intelligence. In Northern Ireland other important barriers have also been identified. The Innovate NI[12] report identifies a culture of risk aversion, lack of openness to collaboration, lack of leadership, technological, R&D and creative thinking skills.

Also the structure of businesses in Northern Ireland is a significant barrier to innovation, with a large number of small and medium sized enterprises (SMEs), together with a high proportion of sole traders.

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[10] Agricultural Knowledge and Innovation Systems towards 2020, SCAR (2013)
[11] Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025
[12] Innovate NI Innovation Strategy for Northern Ireland 2014 - 2025

Micro businesses are estimated to make up over 95% of Northern Ireland businesses. Innovation within SMEs and micro businesses is hampered by issues such as a lack of financial resources, low appetite for risk and insufficient staff training in innovation and creativity.

4.8   Of particular relevance to this draft strategy, the Organisation for Economic Co-operation and Development (OECD)[13] highlights the need for governments to '*not only be innovative; they must also create the right conditions for innovation within and across systems'*. A lack of innovation within the public sector, has emerged as a key barrier to innovation within those sectors which are supported, facilitated and incentivised through government departments. Risk aversion, bureaucratic structures and skills shortages are seen as key issues. Public organisations often struggle to generate enough ideas, partly due to a conservative approach to risk management related to the use of public funding. An innovative and enterprising public sector is vital to help address industry and societal challenges ahead.

[13] Fostering Innovation in the Public Sector, OECD (2017)

Why do we need an Innovation Strategy for DAERA?

4.9   A high level SWOT (Strengths, Weaknesses, Opportunities and Threats) assessment was undertaken, considering the innovation position in both DAERA business areas and the sectors for which it has responsibility. These are shown diagrammatically in:

Figure 2 - SWOT analysis of innovation within DAERA;

Figure 3 - SWOT analysis of innovation in the areas within DAERA's remit.

The ingredients needed for innovation are shown in:

Figure 4 - What inward facing action does DAERA need to take to support innovation in the areas within its remit?

Figure 5 - What outward facing action does DAERA need to take for innovation to flourish in the areas within its remit?

Through developing a strategy that can exploit the opportunities and mitigate the threats identified, DAERA will be positioned to optimise its ability to support increasing innovation. This analysis has informed the strategic mission, principles and goals of this draft Innovation Strategy.

4.10   Three clear overarching themes that will drive efficiencies and progress in all DAERA relevant sectors and deliver on the protection of the environment have emerged during the development of this strategy. Economy 2030[14] identified digital technologies as an area where Northern Ireland has world class capabilities. This aligns with the Department for Business, Energy and Industrial Strategy (BEIS) Industrial Strategy 2017[15] , which highlighted '*Artificial Intelligence and the Data Economy'* as a Grand Challenge to put the UK at the forefront of the industries of the future. The importance of Artificial Intelligence (AI) in underpinning future prosperity was evidenced in the UK Government AI Sector Deal Policy[16] paper.

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[14] Economy 2030 - Northern Ireland Draft Industrial Strategy (DfE) (2017)
[15] BEIS UK Government Industrial Strategy (2017)
[16] UK Government AI Sector Deal Policy Paper (2019)

4.11   The increasing importance of the bioeconomy was reflected in the production of the UK Growing the Bioeconomy Strategy 2030[17]. Furthermore, Horizon Europe's Strategic Plan Consultation[18] has identified '*Reinforced supply of sustainable biomaterials and bio-economy'* as a key policy objective.

4.12   The development of innovation in the utilisation of Big Data, AI and a Transformative Bioeconomy will be prioritised in this strategy.

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[17] Growing the Bioeconomy: A national bioeconomy strategy to 2030 (2018)
[18] Horizon Europe's Strategic Plan Consultation (2019)

Figure 2 SWOT analysis of innovation within DAERA

- Good governance structures.
- Organisation structures which link knowledge generation to knowledge exchange processes.
- Strong links with industry stakeholders.
- Currently delivering schemes to support innovation in agri-food.
- Access to DoF Innovation Lab.

- Conservative risk appetite.
- Organistion culture.
- Lack of dedicated teams, budgets, processes and skills.
- Limited engagement between government, industry and academia.
- Limited innovation provision in education.
- Silo working.
- Limited influence on UK innovation strategies and funding.
- Awareness of barriers.

- Training to encourage staff to engage in innovation.
- Dedication of resources to supporting innovation within DAERA and sectors.
- Establishment and growth of UK/EU networks.
- Developing a culture supportive of innovation.
- Public funding can be used as leverage.
- Open innovation - sharing of data.
- Targeting and prioritisation of effort to optimise innovation impact.

- Change too slow to exploit opportunities.
- EU exit may consume attention and resources.
- Funds not made available to progress innovation measures.
- Lack of leadership to make step change required to DAERA to boost innovation in industry.
- Limited engagement.
- Insufficient influence on national funding priorities.

Figure 3 SWOT analysis of innovation in the areas within DAERA's remit

Strengths
- Some innovators already operating in industry.
- Currently agri-food industry can avail of DAERA RDP innovation schemes.
- Avaliablity of DAERA and EU R&D funding.
- Support through DfE and Invest NI.

Weaknesses
- NI has the lowest level of innovation in the UK.
- Funding environment is opaque and difficult.
- Lack of skills and understanding of innovation.
- Farmers, producers and others in supply chain often work in isolation.
- Fear of failure.
- Lack of access to information.
- Risk averse culture.

Opportunities
- EU exit, Big Data, Artificial Intelligence and Bioeconomy presenting opportunities to significantly change approaches.
- Create an environment which encourages innovation.
- Many funding streams available for innovation activities.
- Establishment of resources and structures to encourage, guide and support innovation has the potential to lead to innovation uptake.
- Technological advancement relevant to all sectors.
- Establish and promote funding streams available for innovation activities.

Threats
- EU exit uncertainties
- Relevant sectors/industry fall behind in technological advancements.
- Barriers to collaborative innovation include mistrust, data sharing issues and IP rights.
- Lack of leadership and support at government level.

Figure 4 What inward facing action does DAERA need to do take support innovation in the areas within its remit?
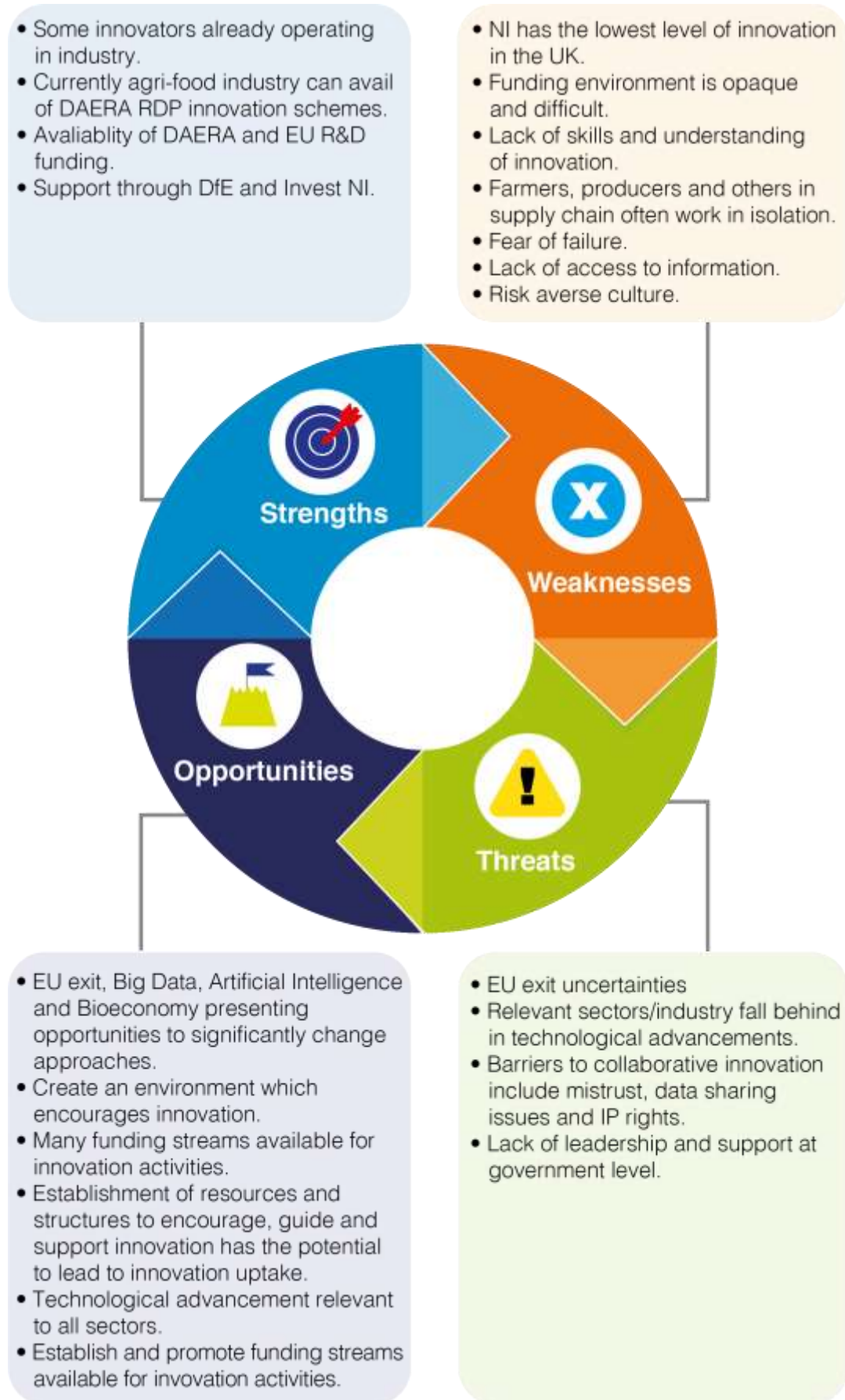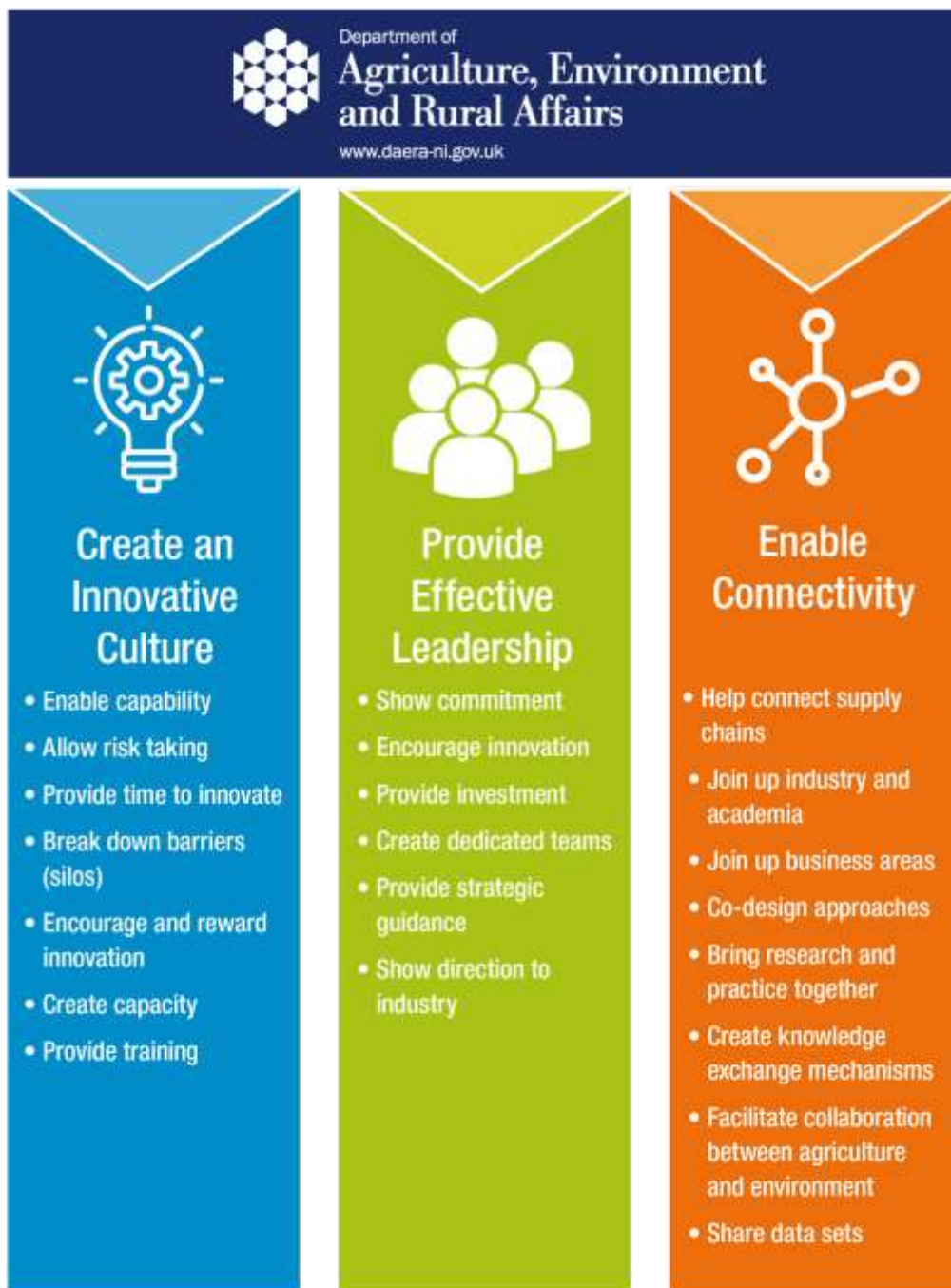
Figure 5 What outward facing actions does DAERA need to take for innovation to flourish in the areas within its remit?

DAERA Stakeholders

Education/training/skills

- Train all DAERA staff in innovation and creativity;
- Investigate innovation scholarships and apprenticeships;
- Employ graduates with innovation skills;
- Collaborate with universities and colleges to provide innovation education;
- Include innovation in all DAERA FE/HE courses;
- Make industry more aware of innovation through education programmes, knowledge transfer and innovation support;
- Prioritise innovation in DAERA Post Graduate Studentship Programme;
- Support Knowledge Transfer Partnerships;
- Encourage Employer Support Programmes.

Collaboration and networking

- Develop effective relationships with networks such as Innovate UK, UK Research Councils, Science and Innovation Network (SIN), European Innovation Partnerships (EIP-AGRI), Knowledge and Innovation Communities, other government bodies and local networks;
- Interact with European networks post Brexit through NI Contact Point (NICP)
- Establish and manage a Rural Innovation Support Service (RISS);
- Provide support for early adopters through BDGs, FIV , EIP and Technical Demonstration Farms;
- Identify and promote funding channels/where necessary;
- Improve success in uptake of innovation funding;
- Help roll out Innovation Accreditation Scheme;
- Increase use of the Employer Support Programme;
- Improve industry interaction with Knowledge Transfer Network.

Communication and promotion

- Establish a DAERA Innovation Unit;
- Implement an Innovation Communication and Promotion Plan;
- Share success stories to encourage others;
- Benchmark innovation quality;
- Showcase innovation excellence and best practices;
- Promote the economic impact of innovation.

Knowledge exploitation

- Create an open innovation culture within DAERA;
- Establish a DAERA Digital Innovation Hub;
- Showcase innovative solutions in Big Data, Artificial Intelligence and Transformative Bioeconomy to end users;
- Optimise opportunities to breakdown barriers to innovation;
- Better understand industry R&D and innovation needs;
- Create the knowledge generation through to exploitation feedback loop;
- Breakdown barriers to collaborative projects becoming commercial successes;
- Explore government capital finance for scaling up.

What are Big Data, Artificial Intelligence and the Transformative Bioeconomy?

Big Data

4.13   Big Data relates to capturing relevant data from the huge number of sources available today and translating it into actionable information to improve business processes and help to solve a wide range of problems quickly.

A wide range of Big Data technologies have been developed. In agriculture, for example, devices have been created to measure soil moisture and nutrient density; tractor mounted sensors can measure crop yields; predictive weather stations and image capturing satellites are available; as are drones, that can map out land and monitor crop health, to name a few. The data generated can then be accessed via software programmes on smartphones, computers, and tablets.

Digital technologies are used to collect, store, manage and provide datasets on a wide range of natural heritage, water, land use, climate change and marine topics. The Big Data generated can provide robust evidence for planning and investment decisions, which drive resource efficiency and the protection, enhancement and use of our Natural Capital[19].

Artificial Intelligence

4.14   Artificial Intelligence or 'AI', is an area of computer science that involves machine learning based on statistical analyses, to develop 'intelligent machines'. It can be used to improve the efficiency of daily tasks.

AI has a wide range of applications across agri-food, fisheries, forestry, the environment and the rural economy. In the environment, AI is driving forward our knowledge of the natural environment, including the assessment of natural capital, habitat condition, change detection and ecosystem services.

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[19] Natural capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things.

Earth observation technologies and machine learning algorithms are used to deliver regional scale habitats/land cover mapping. Digital science capability lies at the heart of the drive to deliver a step change in our understanding of the environment and the services it provides to formulate innovative solutions to complex issues.

In forestry, AI combined with satellite imagery can be used to monitor forest health and to detect forest threats.

In agriculture, AI helps farmers make better decisions. Evolving technologies using AI in agriculture include:

- Automatic picking/harvesting robotics;
- Facial recognition software which uses machine learning and imaging technologies to identify dairy cows and obtain information about individual animals such as behaviour and feed consumption without the need for wearable devices;
- Airborne surveillance with drones - precision sensors look for stunted crops, signs of pests, disease, weeds and many other variables.

Transformative Bioeconomy

4.15   The world has limited resources. Global challenges like climate change, land and ecosystem degradation, coupled with a growing demand for food, feed and energy mean that we have to seek new ways of producing and consuming. A sustainable and circular bioeconomy offers an opportunity to address these challenges and encapsulates various sectors including agriculture, environment and aquaculture.

Traditionally we have relied on the use of oil and other fossil fuels to produce many of the goods we need. A Transformative Bioeconomy requires us to make lasting changes to the resources we use and adopt creative and innovative techniques to make the products we require from renewable resources and waste streams. This includes producing and selling food, feed, bio-based products and bioenergy; using renewable materials that are made from organic, carbon based biological matter, instead of being produced from oil.

4.16   The bioeconomy is already part of everyday life for many people. In
        Northern Ireland the transformative bioeconomy is reported to have
        contributed 17.4% of the total regional GVA in 2014[20]. It is estimated that
        more than 13,000 jobs could be created by 2030 if Northern Ireland
        moved to a circular economy. Jobs would be at various skills levels within
        a number of sectors including food and drink, biorefining and the wider
        bioeconomy[21]. Biological resources and innovative technologies are
        being used to replace unsustainable products and processes that
        currently rely on fossil resources. Some bio-based goods may even have
        novel properties which make them superior to the products we currently
        depend on.

        In order to meet the world's challenges, cutting edge biological and
        technological knowledge and methods for both intensive yet sustainable
        production, provision and processing of biomass[22] are needed to bring
        about the transformative changes necessary to develop the bioeconomy;
        to contribute to reducing the burden on the environment; and to
        conserving the earth's finite resources.

[20] Evidencing the Bioeconomy - An assessment of evidence on the contribution of, and growth
opportunities in, the bioeconomy in the United Kingdom, 2016
[21] Job creation in the circular economy - increasing resource efficiency in Northern Ireland,
ReNEW Network, 2015
[22] Biomass is plant or animal material used for energy production (electricity or heat), or in
various processes as raw material for a range of products (eg textiles, packaging, biofuels). It can
be purposely grown energy crops (eg *Miscanthus),* wood or forest residues, waste from food
crops (eg wheat straw), horticulture (compost), food processing, livestock (animal slurry) or
human waste from sewage plants

Section 4 Questions

Q2 What are your views on the need for an Innovation Strategy within DAERA?

Q3 What are your views to the barriers to innovation identified?

Q4 What are your views on the innovation themes prioritised ie Big Data, Artificial Intelligence and Transformative Bioeconomy?

SECTION 5

5. DAERA Science Strategy

5.1   DAERA is implementing a Science Transformation Programme. This programme aims to ensure that the science secured and used by DAERA will be innovative, collaborative and transformative and will support a healthy and sustainable economy, environment and rural community; help deliver the PfG outcome, help meet UN Sustainable Goals and contribute to a living, working, active landscape valued by everyone.

5.2   As part of the Science Transformation Programme a DAERA Science Strategy Framework has been developed. This will guide how DAERA can optimise its use of science to help deliver Departmental and PfG objectives. This Innovation Strategy, alongside Monitoring and Surveillance and R&D operational strategies, derives from the Science Strategy Framework.

Innovation Strategy Mission

5.3   **An innovation ecosystem delivering for the environment, society and the rural economy**

- through creating an enabling environment for innovation to flourish and to enhance the impact of knowledge generation and science investments, through collaboration and exploitation, delivering positive, measureable outcomes for the Northern Ireland environment and economy.

Scope

5.4   This strategy will apply to DAERA and the Northern Ireland agri-food, fisheries and forestry sectors, rural affairs and the decarbonisation, adaptive capacity, conservation and enhancement of the environment.

Section 5 Question

Q5 What are your views on the Innovation Strategy Mission and Scope DAERA has proposed?

SECTION 6

6. Principles

6.1 The principles defined in the DAERA Science Strategy Framework apply to this Innovation Strategy. Additional principles specific to innovation are:

What?

6.2 DAERA investment in innovation will support the development of an innovation enabling culture, capability and capacity to improve economic performance whilst improving resource efficiency, enhancing the sustainability of the environment and mitigating the effects of climate change.

Why?

6.3 To stimulate and support innovation that contributes to Northern Ireland being a modern, creative, adaptive and climate resilient society, which prospers through having a strong, competitive, sustainably balanced economy.

How?

6.4 DAERA will seek to optimise the value of its investment in innovation through always:

- Providing effective, skilled leadership which can drive change and create the values and behaviours that promote and reinforce the culture of innovation;
- Engaging with stakeholders, experts and funders to inform a comprehensive and accurate understanding of innovation needs, barriers and opportunities;
- Targeting DAERA investment in innovation to optimise the beneficial impact for Northern Ireland;
- Working across government to facilitate and remove barriers to innovation;

- Building and maintaining DAERA credibility and influence with UK and international funding bodies to optimise the relevance of opportunities to the Northern Ireland agri-food, fisheries and forestry sectors, rural affairs and in the decarbonisation, adaptive capacity, conservation and enhancement of the environment;

- Encouraging and supporting a culture, capability and capacity both within DAERA and the business sectors within DAERA's responsibilities, to maximise innovation;

- Applying effective and efficient governance mechanisms for DAERA supported innovation investment;

- Evaluating the impact of DAERA's investment in innovation through measuring industry and environment outcomes.

6.5   The general principles determining funding considerations are:

- There will be a greater need for public funding where the innovation primarily provides for wider societal, environmental or public good rather than economic benefits, or is high risk, and therefore, unlikely to be progressed by commercial organisations;

- There will be a focus on leveraging private funding when the innovation provides benefits to commercial organisations e.g. increased market access, industry growth or profitability;

- All opportunities to use public funding to leverage and complement private investment in innovation (i.e. where this would not otherwise happen) will be explored.

For innovation to flourish in the public sector there will be a need for greater risk appetite. This will involve assessing and managing the level of risk more effectively to balance the potential benefits of innovation and the threats that change required to meet objectives inevitably brings.

These principles for innovation provision have been forefront in the development of the objectives of this strategy which are aimed at addressing issues and grasping opportunities identified in the strategic context and through the research and stakeholder engagement processes conducted.

Section 6 Question

Q6 What are your views on the principles behind what, why and how DAERA will support innovation?

7. Goals and objectives

7.1   Three goals, together with the objectives to achieve them, have been identified. Activities associated with each of these objectives (subject to the availability of appropriate funding) are outlined in Annex 5.

Goal 1

7.2   DAERA identifies innovation as a Departmental priority. It has the leadership, culture, capability and capacity to sustainably encourage and support innovation in all sectors. It prioritises support for innovation involving the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy.

Objectives

a.   To establish appropriate senior and dedicated resource in DAERA (**by summer 2020**), to provide direction and leadership; to champion and govern the development of an innovation culture that can yield successful, sustainable adoption of innovation in line with this strategy.

b.   To define and implement a programme of learning for DAERA staff **(by summer 2021)** to ensure DAERA has the capability and capacity to support innovation.

c.   To establish and grow an 'open innovation' culture within DAERA through the establishment of an internal Innovation Unit and a Digital Innovation Hub to allow the importing and exporting of knowledge and insights from academia, the private sector, the third sector and the public **(by autumn 2021).** The network required for an enabling environment for innovation to flourish within DAERA is shown in Annex 3.

d.   To establish and grow networks and support mechanisms with other government bodies and funders and together explore key issues which present potential barriers to innovation and identify mitigations to better facilitate innovation **(by summer 2021).**
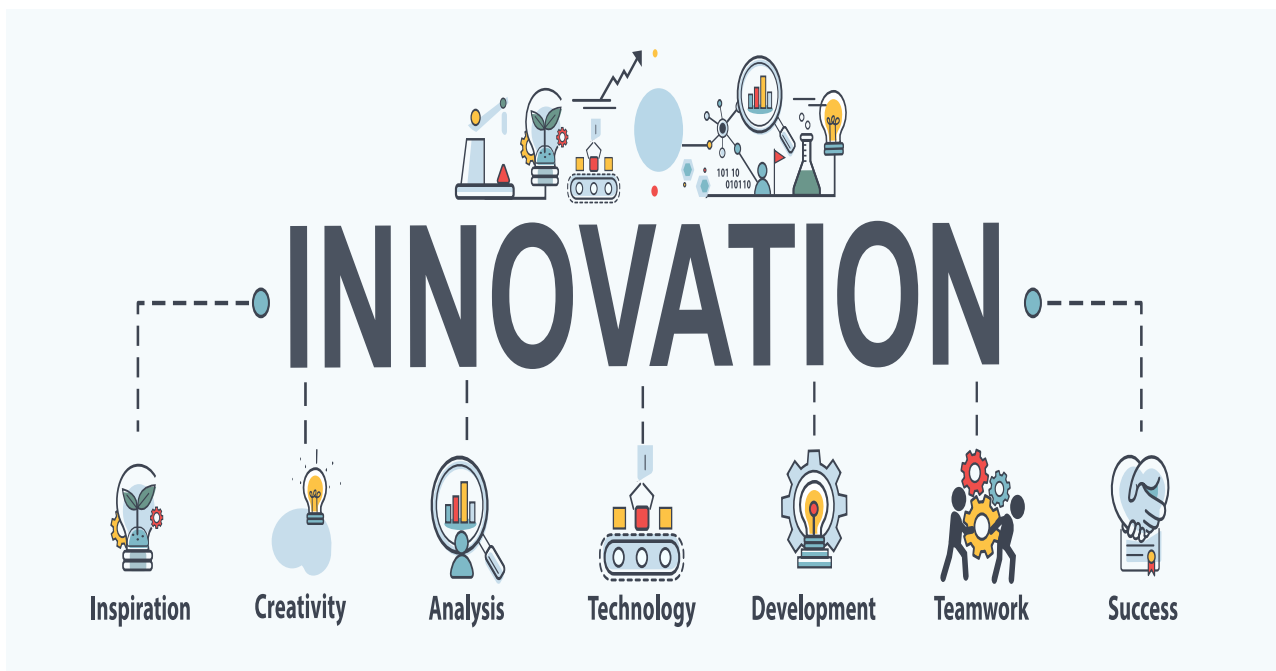
Goal 2

7.3   Innovation is encouraged, supported, and facilitated by DAERA across all sectors in its remit.

Objectives

a.   To raise awareness and generate interest in the role of innovation, through implementing a Communications and Promotional Plan by (**by autumn 2020)**.

b.   To establish and grow a Rural Innovation Support Service (RISS)[23] network to support collaboration and encourage an innovation culture. The DAERA RISS will facilitate the provision of professional support, through a facilitator, to groups of like-minded individuals who want to test new ideas and find feasible, sustainable solutions to common challenges (**by autumn 2021**).

c.   To encourage capacity and capability building for innovation (aligning with the DAERA Knowledge Framework), through making available, promoting and encouraging participation in appropriate programmes of learning at Further Education and Higher Education level, for both new entrants and Continuing Professional Development (**by autumn 2021)**.

d.   To identify barriers to innovation with a view to exploring how these can be mitigated, including through providing support and funding mechanisms (**by summer 2021**).

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[23] An RISS is led by the Soil Association in Scotland and funded through the Scottish Rural Development Programme. RISS provides professional support to groups of farmers interested in innovation.

Goal 3

7.4   The ultimate goal is that by 2035, Northern Ireland will be the most successful region in the UK at exploiting opportunities in the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy in the sectors within the DAERA remit. In line with this direction of travel, by 2025, NI will be in the top 50% of UK regions. This will be monitored through liaison with Innovate UK/UKRI.

Objectives

a.   To establish discrete Task Forces involving relevant departments, experts and industry/sector stakeholder representatives to explore opportunities and develop proposals for exploiting Big Data, AI and the Transformative Bioeconomy (**by autumn 2020)**.

b.   To prioritise DAERA R&D project funding to the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy **(by autumn 2021).**

c.   To monitor and report progress for the sectors within the DAERA remit, through regional benchmarking of employment in knowledge intensive sectors[24], R&D expenditure[25] and private sector turnover[26] from innovation.

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[24] Measured by NISP Knowledge Economy Index
[25] Measured by NISRA Survey
[26] Measured by UK Innovation Survey and NISRA Annual Business Inquiry

Section 7 Questions

Q 7   From your perspective, are the goals appropriate?

Q 8   From your perspective, are there any goals missing?

Q 9   From your perspective are there any goals that are more important than others? If 'yes', which are they?

Q10 What are your views on the proposal to establish a Senior Civil Service led resource to champion and govern innovation culture?

Q11 What are your views on the proposal to implement a programme of innovation learning for DAERA staff?

Q12 What are your views on the establishment of an internal DAERA Innovation Unit?

Q13 What are your views on the establishment of a DAERA Digital Innovation Hub?

Q14 What are your views on mechanisms to identify and mitigate barriers to innovation?

Q15 What are your views on the implementation of an Innovation Communications and Promotional Plan?

Q16 What are your views on the establishment of a Rural Innovation Support Service?

Q17 What are your views on DAERA promoting and encouraging participation in innovation related programmes of learning at FE and HE levels?

Q18 What are your views on the identification of barriers to innovation and exploring how these can be mitigated through support and funding mechanisms?

Q19 What are your views on the establishment of Task Forces to identify opportunities in Big Data, AI and the Transformative Bioeconomy?

Q20 What are your views on the prioritisation of DAERA funding to Big Data, AI and the Transformative Bioeconomy projects?

SECTION 8

8. Benefits

8.1   The benefits of implementation of an Innovation Strategy by DAERA are described in Table 1. Methods of obtaining evidence of progress for each of the benefits are included. Baselines will be established at an early stage of strategy implementation. Delivery of the key objectives detailed within the Innovation Strategy will also provide evidence of progress.

A DAERA Innovation Report will be produced at the mid and end points of this strategy implementation and will include:

- An evaluation of progress against goals and objectives to ensure we are on track for delivery and that necessary adjustments can be made in a timely manner;
- An assessment of innovation performance within agri-food, environment, marine and fisheries, forestry and rural communities;
- Recommendations for future actions and policy direction.

A retrospective evaluation will also be carried out on this strategy at the end of its term (2025) to inform the development of its successor.

TABLE 1 Benefits of implementation of an Innovation Strategy by DAERA

Benefit	Description	Evidence of progress
Increased innovation in agri-food, environment, fisheries, forestry and rural communities.	Benefits in external impact such as; - Improved adoption and exploitation of innovative technologies particularly in Big Data, Artificial Intelligence and the Transformative Bioeconomy; - Targeted and effective policy on innovation to help tackle challenges, issues and opportunities in industry, resulting in increased adoption of innovation; - New and improved education and support systems to provide the skills needed for innovation in rural businesses and to enhance rural entrepreneurship, which supports increased adoption of innovation.	Case studies to highlight innovative adoption of Big Data, Artificial Intelligence and the Transformative Bioeconomy. UK Innovation Survey: Northern Ireland Results. Numbers participating in DAERA Innovation schemes e.g. FIV, EIP and ITEDS. Inclusion of elements or modules relating to innovation within all DAERA courses and programmes. DAERA Innovation Unit monitoring figures.
Improved value for money.	Benefits in use of public money, such as: - Increased impact from investment in innovation and R&D by industry and increased draw-down of external, competitive funding as a result of improved collaboration and co-funding, supporting increased adoption of innovation.	NISRA R&D Survey. UKRI Gateway to Research. DfE innovation and R&D figures. Increased draw down of external funding as measured by: UK innovation Survey: Northern Ireland Results NISRA R&D Survey UKRI Gateway to Research

		Enhanced existing IP protocol developed.
	- Investigation into Intellectual Property barriers and possible mitigation.	
Improved collaboration and strategic alliances.	Benefits in use of networks such as: Improved working across government to facilitate an innovation enabling environment including mitigating barriers to innovation; Increased credibility and influence with UK and international funding bodies to optimise the funding opportunities for NI agri-food, environment,fisheries, forestry and rural communities.	Official recording of all DAERA networking within other jurisdictions in relation to innovation Increased draw down of external funding as measured by: UK innovation Survey: Northern Ireland Results NISRA R&D Survey UKRI Gateway to Research
Improved staff expertise.	Benefits to staff such as: - Increased investment in training and competence development to improve staff expertise in innovation and creativity, leading to increased productivity, improved policies and practices and a better working environment; - Embedding of more innovative ways of working leading to increased adoption of innovation both within and external to DAERA.	DAERA staff training figures. DAERA Staff Pulse Surveys. Industry surveys through Business Development Groups.

| Improved innovation and creativity within DAERA. | Benefits to internal management of DAERA such as:

Improved culture, capability and capacity within DAERA, including better strategic alignment to key objectives relating to innovation, improved leadership and management processes, targeted investment in innovation, and prioritisation of innovative R&D.

Improved staff confidence in thinking and working innovatively, expertise, supporting increased adoption of innovation, both within and external to DAERA. | DAERA Innovation Champion in post

DAERA Innovation Unit established and operational

Innovation prioritised within all DAERA R&D Priority Research Areas DAERA Staff Pulse Surveys. |

Section 8 Question

Q21 What are your views on the benefits of implementation and evidence of progress described?

SECTION 9

9. Rural needs considerations

9.1   DAERA has a statutory duty to screen decisions to consider the likely impacts of proposed decisions on rural areas.

9.2   A Rural Needs Assessment has been completed.

9.3   While potential impacts of the strategy on rural areas have been identified, the Rural Needs Assessment template is a living document and therefore any additional views you may have on how the strategy could impact rural areas are welcome.

Section 9 Question

Q22   Are there any considerations on rural needs you wish to raise at this point? Do you have evidence that would be useful to DAERA? If so, please describe the evidence and provide a copy.

SECTION 10

10. Equality considerations

10.1   Section 75 of the NI Act 1998 (the Act) requires public authorities, in carrying out their functions relating to Northern IrelandI, to have due regard to the need to promote equality of opportunity and regard to the desirability of promoting good relations across a range of categories outlined in the Act. DAERA commits to having effective internal arrangements in place for ensuring our effective compliance with the Section 75 statutory duties and for monitoring and reviewing our progress.

10.2   In the context of Section 75, 'policy' is very broadly defined and it covers all the ways in which we carry out or propose to carry out our functions. In making any decision with respect to a policy adopted or proposed to be adopted, we take into account any assessment and consultation carried out in relation to the policy.

10.3   DAERA uses the tools of screening and Equality Impact Assessment to assess the likely impact of a policy on the promotion of equality of opportunity and good relations. Screening is completed at the earliest opportunity in the policy development/review process. Policies which we propose to adopt will be subject to screening prior to implementation. For more detailed strategies or policies that are to be put in place through a series of stages, we will screen at various stages during implementation.

10.4   An Equality and Human Rights screening has been completed for this strategy and the data required to monitor the impact of the strategy when implemented, on equality, good relations and disability duties have been identified. Further Equality and Human Rights screening will be undertaken before more detailed elements of the Innovation Strategy are put in place.

Section 10 Question

Q23   Are there any considerations on equality that you wish to raise at this point? Do you have any evidence that could be useful to DAERA? If so, please describe the evidence and provide a copy.

SECTION 11

11. Abbreviations

AF	Agri-food
AI	Artificial Intelligence
AFBI	Agri-food and Biosciences Institute
BDG	Business Development Group
BEIS	Department for Business, Energy and Industrial Strategy
DAERA	Department of Agriculture, Environment and Rural Affairs
DARD	Department of Agriculture and Rural Development
DCAL	Department of Culture, Arts and Leisure
DE	Department of Education
Defra	Department of Environment, Food and Rural Affairs
DfE	Department for the Economy
DOE	Department of Environment
DoF	Department of Finance
EC	European Commission
EIP	European Innovation Partnership
EU	European Union
FIV	Farm Innovation Visits
GDPR	General Data Protection Regulation
GVA	Gross Value Added
IP	Intellectual Property
ISCF	Industrial Strategy Challenge Fund
IT	Information Technology
ISMS	Information Security Management System
KAS	Knowledge Advisory Service
NESTA	National Endowment for Science, Technology and the Arts
NI	Northern Ireland
NICS	Northern Ireland Civil Service
NISRA	Northern Ireland Statistics and Research Agency
OECD	Organisation for Economic Co-operation and Development
OFMDFM	Office of the First and Deputy First Ministers
PfG	Programme for Government

QUB	Queens University Belfast
R&D	Research and Development
RISS	Rural Innovation Support Service
RPD	Rural Development Programme
SBRI	Small Business Research Initiative
SCAR	Scientific Committee for Agricultural Research
SIN	Science and Innovation Network
SME	Small and Medium Sized Enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
TRPSI	Tackling Rural Poverty and Social Isolation
UK	United Kingdom
UKRI	UK Research and Innovation
UN	United Nations
UU	University of Ulster

SECTION 12

12. Capturing stakeholder views - next steps

DAERA welcomes responses and comments from stakeholders on the questions outlined in this document to help develop proposals for a DAERA Innovation Strategy.

How to respond

A full list of questions in this document can be found at Section 13.

When responding please provide the following information:

Your name;

Contact details (preferably e-mail); and

Organisation you represent (if applicable).

Responses should be sent to:

By e-mail to: STPMO@daera-ni.gov.uk

By post to: Science Evidence and Innovation Policy Division

Department of Agriculture, Environment and Rural Affairs

Room 643

Dundonald House

Upper Newtownards Road

Ballymiscaw

Belfast

BT4 3SB

Telephone: (028) 9037 8389

The closing date for responses is 5th March 2020

Please ensure your response is submitted by that date.

Publication of responses

At the end of the engagement, the Department intends to publish a summary of responses following the closing date for receipt of views. Your response, and all other responses to this publication, may be disclosed on request. The Department can only refuse to disclose information in exceptional circumstances. Any confidentiality disclaimer generated by your IT system in e-mail responses will not be treated as such a request.

Section 8(e) of the Data Protection Act 2018 permits processing of personal data when necessary for an activity that supports or promotes democratic engagement. Information provided by respondents to this stakeholder engagement exercise will be held and used for the purposes of the administration of this current exercise and subsequently disposed of in accordance with the provisions of the Data Protection Act 2018 and General Data Protection Regulation.

The Freedom of Information Act gives the public a right of access to any information held by a public authority, namely, the Department in this case. This right of access to information includes information provided in response to a stakeholder engagement exercise. The Department cannot automatically consider as confidential information supplied to it in response to a stakeholder engagement exercise. However, it does have the responsibility to decide whether any information provided by you in response to this stakeholder engagement exercise, including information about your identity, should be made public or be treated as confidential. If you do not wish information about your identity to be made public, please include an explanation in your response.

This means that information provided by you in response to the stakeholder engagement is unlikely to be treated as confidential, except in very particular circumstances. The Lord Chancellor's Code of Practice on the Freedom of Information Act provides that:

• The Department should only accept information from third parties in confidence if it is necessary to obtain that information in connection with the exercise of any of the Department's functions and it would not

otherwise be provided; The Department should not agree to hold information received from third parties "in confidence" which is not confidential in nature; and

• Acceptance by the Department of confidentiality provisions must be for good reasons, capable of being justified to the Information Commissioner.

For further information about confidentiality of responses please contact the Information Commissioner's Office. (https://ico.org.uk/)

SECTION 13

13. Questions

1	What are your views on the strategic context identified?
2	What are your views on the need for an Innovation Strategy within DAERA?
3	What are your views to the barriers to innovation identified?
4	What are your views on the innovation themes prioritised i.e. Big Data, Artificial Intelligence and Transformative Bioeconomy?
5	What are your views on the Innovation Mission and Scope DAERA has proposed?
6	What are your views on the principles behind what, why and how DAERA will support innovation?
7	From your perspective, are the goals appropriate?
8	From your perspective, are there any goals missing?
9	From your perspective are there any goals that are more important than others? If 'yes', which are they?
10	What are your views on the proposal to establish a Senior Civil Service led resource to champion and govern innovation culture?
11	What are your views on the proposal to implement a programme of innovation learning for DAERA staff?
12	What are your views on the establishment of an internal DAERA Innovation Unit?
13	What are your views on the establishment of a DAERA Digital Innovation Hub?
14	What are your views on mechanisms to identify and mitigate barriers to innovation?
15	What are your views on the implementation of an Innovation Communications and Promotional Plan?
16	What are your views on the establishment of a Rural Innovation Support Service?
17	What are your views on DAERA promoting and encouraging participation in innovation related programmes of learning at FE and HE levels?
18	What are your views on the identification of barriers to innovation, and exploring how these can be mitigated through support and funding mechanisms?

19	What are your views on the establishment of Task Forces to identify opportunities in Big Data, AI and Transformative Bioeconomy?
20	What are your views on the prioritisation of DAERA R&D funding to Big Data, AI and Transformative Bioeconomy projects?
21	What are your views on the benefits of implementation and on how we can measure benefits delivered?
22	Are there any considerations on rural needs you wish to raise at this point? Do you have evidence that would be useful to DAERA? If so, please describe the evidence and provide a copy.
23	Are there any considerations on equality that you wish to raise at this point? Do you have any evidence that could be useful to DAERA? If so, please describe the evidence and provide a copy.

SECTION 14 - Annexes

Annex 1 Northern Ireland Innovation Rankings

Department for the Economy, UK Regional Innovation Ranking (2008 – 2016)[27]

Wider Innovation in the UK and Northern Ireland (2004 - 2016)[28]

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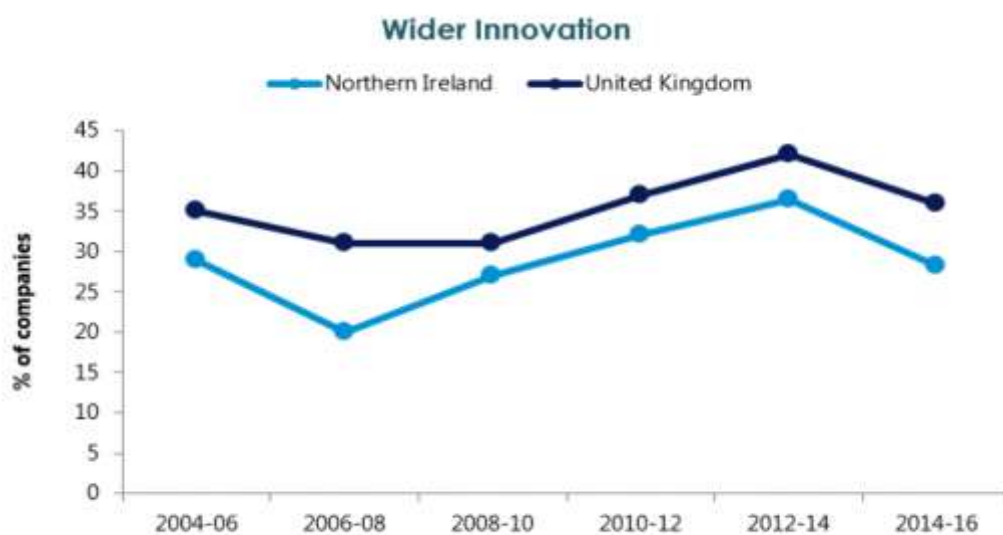
[27] Department for the Economy UK Regional Innovation Ranking. Northern Ireland moved down one position in the 2014-2016 survey and remains the least innovative region in the UK.
[28] Department for the Economy Theme 1: Innovation. The Northern Ireland Innovation Survey is a subset of the UK wide Innovation Survey and provides a regular snapshot of innovation inputs and outputs. NI has consistently had a smaller proportion of firms engaged in wider innovation than the rest of the UK.

Annex 2 Goals and objectives of the Innovation Strategy and associated activities

Affordability will be subject to the availability of resource and capital funding as well as EU replacement funding in future budget exercises

Goal 1

DAERA identifies innovation as a Departmental priority. It has the leadership, culture, capability and capacity to sustainably encourage and support innovation in all sectors. It prioritises support for innovation involving the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy.

Objectives		Activities
1. To establish an appropriate senior and dedicated resource in DAERA to provide direction and leadership; to champion and govern the development of an innovation culture both in the Department and in the NI agri-food, fisheries and forestry sectors, rural affairs and in the conservation and enhancement of the environment that can yield successful, sustainable adoption of innovation in line with this strategy.	Summer 2020	Establish a dedicated division, to lead, champion and support the implementation of the Innovation Strategy. Establish an Innovation Advisory Board, to provide expert (internal and external) advice on innovation trends and new technologies relevant to all aspects of the DAERA remit. Establish an Innovation Champion role in DAERA to support the development of an enabling culture and provide a visible emphasis of leaders' commitment to innovation within DAERA.
2. To define and implement a programme of learning for DAERA staff to ensure DAERA has the capability and capacity to support innovation.	Summer 2021	Training on creativity and innovation provided to all DAERA staff. In-depth competence development learning programmes specific to innovation roles/business areas. Innovation competences and behaviours identified as key competences for all DAERA staff roles (and proposed for inclusion in the NICS Competence Framework).

		The Knowledge Advisory Service (KAS) consolidates innovation messages and opportunities through its interactions with industry and raises awareness of available programmes of education, knowledge transfer and industry support.
3. To establish and grow an 'open innovation' culture within DAERA through the establishment of an internal Innovation Unit and a Digital Innovation Hub to allow the importing and exporting of knowledge and insights from academia, the private sector, the third sector and the public.	Autumn 2021	Establish an 'open innovation' culture within DAERA. This is where there is an appetite to look for and consider innovation related knowledge, insights and ideas from across DAERA, NICS, academia, private and third sectors and an enthusiasm to translate ideas with potential into innovations. Establish a DAERA Innovation Division (see objective 1 above) specific to DAERA's needs to assist DAERA business areas in looking at innovative alternatives or solutions to problems, issues, opportunities etc by connecting, collaborating, listening, failing fast, learning, disrupting, inventing and enabling. As a delivery mechanism of the DAERA Digital Transformation Strategy, establish a physical Digital Innovation Hub, which will act as an "intelligent customer" for innovation. It will identify potentially relevant data sources (including where necessary, commissioning work to create data); commission Big Data analyses to yield sector relevant intelligence; translate complex data into accessible, digestible information that can be utilised by DAERA sector end users. Identify and support a network of centres, for innovation competence development and

		where innovative Big Data, AI and Transformative Bioeconomy solutions can be showcased and demonstrated to DAERA sector end users.
4. To establish and grow networks and support mechanisms with other government bodies and funders and together explore key issues which present potential barriers to innovation and identify mitigations to better facilitate innovation.	Summer 2021	Build DAERA relationships with existing networks such as Innovate UK, UK Research Councils, Science and Innovation Network (SIN), European Innovation Partnerships (EIP-AGRI), Knowledge and Innovation Communities, other government bodies and local networks with the aim of: - Exploring key innovation issues; - Addressing barriers to innovation; - Developing collaborative networks and improving training opportunities; - Improving uptake of underutilised funding streams locally eg SBRI, ISCF and Strength in Places Continue DAERA's interaction with European networks post-Brexit through Northern Ireland Contact Point (NICP) to allow access to international and global knowledge and innovations on a timely basis Through the Innovation Advisory Board (see objective 1) and via horizon scanning, determine and communicate with potential global collaboration partners to explore opportunities for innovative projects

Goal 2

Innovation is encouraged, supported, and facilitated by DAERA across all sectors in its remit.

Objectives		Activities
1. To raise awareness and generate interest in the role of innovation in the NI agri-food, fisheries and forestry sectors, rural affairs and in the conservation and enhancement of the environment, through implementing a Communications and Promotional Plan	Autumn 2020	An Innovation Communications and Promotional Plan will be developed and implemented. Innovation practices both internal and external will be showcased. This will include annual conferences, social media activity, organised site visits, collaborative exhibitions, regular publications, educational engagement etc.
2. To establish and grow a Rural Innovation Support Service (RISS) network to support collaboration and encourage an innovation culture in the NI agri-food, fisheries and forestry sectors, rural affairs and in the conservation and enhancement of the environment.	Autumn 2021	Establishment and management of a RISS, which will be implemented externally, to support innovation to address the needs of land managers by forming groups of people together to look at the challenges they face, or opportunities they identify and to think and work through potential solutions. Support the formation of groups through identification of funding channels and the facilitation of a pool of innovation facilitators/brokers. Support the more innovative/early adopters/technically efficient farmers identified through the Business Development Groups (BDG), Farm Innovation Visits (FIV) and the Innovation, Technology, Exhibition Demonstration Scheme (ITEDS).
3. To encourage capacity and capability building	Autumn	Influence all relevant DAERA and DE FE/HE course

for innovation in the NI agri-food, fisheries and forestry sectors, rural affairs and in the conservation and enhancement of the environment, through making available, promoting and encouraging participation in appropriate programmes of learning (at FE and HE level, for both new entrants and Continuing Professional Development).	2021	providers, with the aim of ensuring relevant learning programmes have elements or modules relating to innovation incorporated in them with industry linkages/placements. Investigate provision of Masters level innovation centric programmes, relating to sectors within DAERA's remit. Investigate opportunities for collaboration between DAERA and UU, QUB, AFBI and Competence Centres to provide courses necessary to allow skills shortages in innovation and creativity within the relevant sectors to be addressed. Explore opportunities for apprenticeship schemes, internships and scholarships in innovation and creativity. Review the Evidence and Innovation Post Graduate Awards programmes to ensure that innovative projects are targeted and prioritised.
4. To identify barriers to innovation with a view to exploring how these can be mitigated through providing support and funding mechanisms.	Summer 2021	Collaborate with DfE and delivery partners to roll out the Innovation Accreditation Scheme in DAERA relevant sectors and participate in, or introduce, innovation audits within specific sectors of interest Increase utilisation of the Employer Support Programme by the agri-food sector, with an emphasis on innovation and creativity skills Develop, or enhance existing Intellectual Property (IP) protocols to provide a framework for the commercialisation of

|		
		industry/academia/government collaborative projects.
		Commission a review to evaluate 'scaling up of innovations' in various jurisdictions.
		Investigate capital funding opportunities for innovation adopter.
		Build on the experience with current, relevant, DAERA industry support programmes (Technology Demonstration Farms, EIP) to assist the implementation of this strategy.

Goal 3

The ultimate goal is that by 2035 NI will be the most successful region in the UK at exploiting opportunities in the utilisation of Big Data, Artificial Intelligence and the Transformative Bioeconomy in the sectors within the DAERA remit. In line with this direction of travel, by 2025, NI will be in the top 50% of UK regions. This will be monitored through liaison with Innovate UK/UKRI.

Objectives		Activities
1. To establish discrete Task Forces involving relevant departments, experts and industry/sector stakeholder representatives to explore these issues, identify opportunities and develop proposals for exploiting them in the agri-food, fisheries and forestry sectors, rural affairs and in the conservation and enhancement of the environment.	Autumn 2020	Establishment of 3 Task Forces for Big Data. AI and the Transformative Bioeconomy. consisting of existing staff, recruited specialists, post graduate placements, industry secondments, academics to work outside 'business as usual' systems and not be inhibited by current or historical viewpoints or practices. Task Forces would be required to work collaboratively internally and externally and would have authority to report directly to the Innovation Champion and other senior staff. The Task Forces, chaired by the DAERA Innovation Director/Champion, would provide a platform for dialogue on the subject matter, provide advice on action plans for DAERA and identify the need for specialised expertise. Core staff would be full-time with other utilised as needed.
2. To prioritise DAERA R&D project funding to Big Data,	Autumn 2021	Projects related to Big Data, AI and the Transformative Bioeconomy prioritised by

AI and the Transformative Bioeconomy.		DAERA in the commissioning of R&D and expenditure.
3. Monitor and report progress for the sectors within the DAERA remit, through regional benchmarking of employment in knowledge intensive sectors, R&D expenditure and private sector turnover from innovation.	Mid and End Term Reports	A number of indicators have been identified in Section 8 Benefits that will be used to track the impact that the Innovation Strategy is having and its success in meeting the Vision.

Annex 3 Innovation - Creating an enabling environment
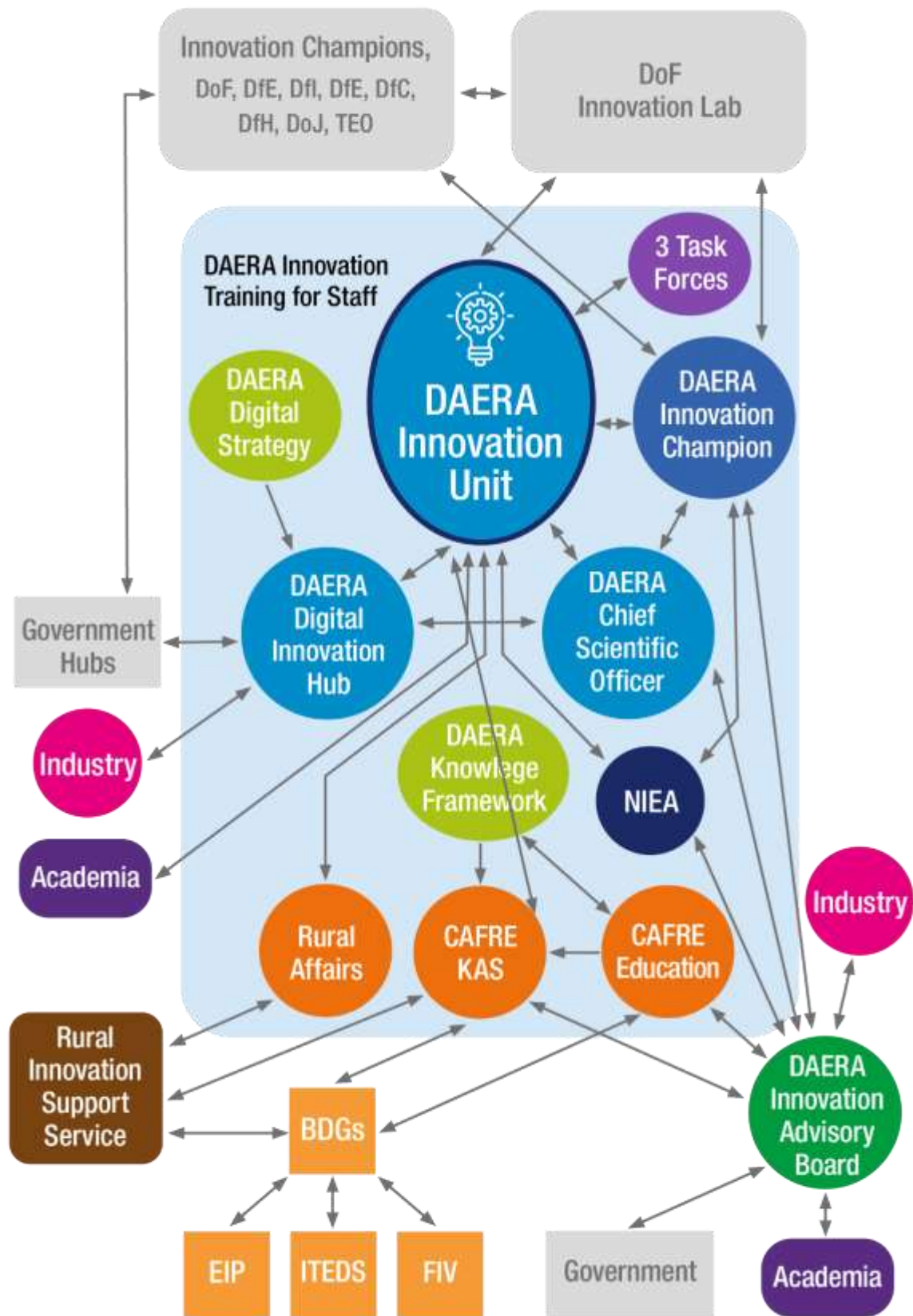
'Innovation is making creativity tangible'

'Innovation is change that unlocks new value'

'Culture eats strategy for breakfast and innovation for lunch'

'Innovations occur where the right conditions exist'

'Innovation is about turning ideas into invoices'

'Innovation is a state of mind'

'Creativity is the price of admission, but it's innovation that pays the bills'

'The best innovators persist and adapt to turn failures into successes'

Department of
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www.daera-ni.gov.uk

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