

Mapping the Innovation and Commercialisation Infrastructure for Agricultural Technology in the UK

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Executive Summary

This report explores the landscape of infrastructure supporting the UK Agri-tech sector and provides insights into the challenges and opportunities for enhancing the commercialisation of Agri-tech innovations in the UK. The report adopts a broad view of 'infrastructure', including physical assets and facilities, as well as organisations providing 'soft' support to Agri-tech companies, such as funding organisations and industry networks.

Despite the UK's world-leading research capabilities in Agri-tech, there are gaps in translating this research into marketable solutions that can achieve widespread commercial success and global reach. Through extensive analysis, this report seeks to identify gaps in the Agri-tech innovation and commercialisation infrastructure landscape and identify potential investment opportunities for policymakers and funding agencies that aim to support the commercialisation and scale-up of Agri-tech in the UK.

Context and Report Aims (Section 1)

The Department for International Trade (DIT) (2021) defined Agri-tech as "any technological or science-based innovation utilised to improve the productivity and sustainability of agriculture, horticulture, aquaculture, and forestry, including on-site storage and processing of food and non-food products. [It also] includes pet care and horses."

The UK Agri-tech sector has witnessed significant growth and innovation in recent years, which has been supported by government policies to position the UK as a global leader in agricultural technology. The sector encompasses a wide range of sub-sectors,

including plant and animal science, precision agriculture, aquaculture, and disruptive technologies like robotics and drones. The **objectives** of this report are to:

- i. Identify and characterise firms that make up the UK Agri-tech business landscape.
- ii. Identify soft and physical public-access infrastructure supporting Agri-tech businesses across Technology Readiness Levels (TRLs).
- iii. Explore the perspectives of Agri-tech businesses and industry experts on gaps in infrastructure provision and other innovation and commercialisation challenges in the sector.
- iv. Identify gaps and investment opportunities for enhancing support for Agri-tech commercialisation in the UK.

Our Approach (Section 2)

The report follows a systematic approach to understanding and mapping the innovation and commercialisation infrastructure for emerging technologies in the UK.¹ Our approach involves a literature review, evidence gathering through Real-Time Industrial Classification techniques (RTICs)², in-depth interviews with 15 Agri-tech companies and five industry experts, and extensive stakeholder discussions (see below). The analysis highlights the main geographical clusters of businesses within the Agri-tech landscape, supported by a rich constellation of 'soft' and physical infrastructure organisations.

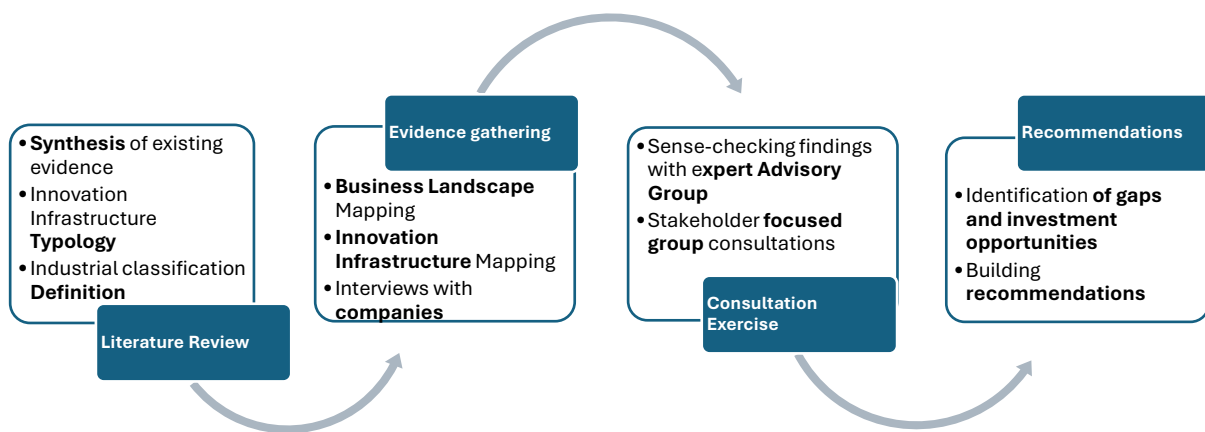


Figure 1: Our approach to understanding Agri-tech innovation and commercialisation infrastructure and identifying gaps.

¹ See [A General Framework for Innovation and Commercialisation Infrastructure for Emerging Technologies - Innovation Research Caucus](#)

² See <https://products.thedatacity.com>

Prior Evidence on Barriers to Agri-tech Commercialisation in the UK (Section 3)

Despite the UK's strong research capabilities and innovation-friendly business environment, previous studies have highlighted several barriers that inhibit the successful commercialisation of Agri-tech. These include:

- » **Access to Finance:** A key barrier for Agri-tech firms, particularly start-ups and scale-ups, is the lack of financial resources to support technological development and commercialisation.
- » **Skills and Expertise:** The lack of specific technical and business expertise in both Agri-tech firms and farmers creates hurdles in commercial adoption.
- » **Collaboration Issues:** Insufficient collaboration between technology developers and end-users, including farmers and the supply chain, limits innovation diffusion.
- » **Slow Adoption Rates:** Farmers face financial and informational challenges that slow new technologies' diffusion.

The UK Agri-tech Business Landscape (Section 4)

Based on new analysis conducted in partnership with The DataCity Ltd, this section provides an overview of the landscape of UK businesses engaged in Agri-tech. Real-Time Industrial Classifications (RTICs) using Web-Scraped data on firms' activities identified 1,277 businesses in Agri-tech in June 2024, covering 4,297 geographical locations.

The Agri-tech business landscape is characterised by various smaller businesses and a few big players; the vast majority of companies (73%) are either microbusinesses with less than 10 employees or no employees. Businesses operate across a range of technology areas, including Agricultural Sciences such as biotechnology (28%), Remote Sensing (19%), Management Platforms (16%), Automation (13%), Drone Technology (10%), Vertical Farming (7%) and Precision Farming (7%). There are variations between activities in firm size profiles and public and private funding patterns.

Analysing the geographical distribution of businesses reveals twenty-one business clusters across the UK³ (see below). We identify an Agri-tech cluster in each of the devolved regions i.e., in Northern Ireland, Scotland (with clusters in Edinburgh and Glasgow) and Wales. In England, there are two clusters in the North West, two in the

³ Each cluster has a minimum of 60 companies engaged in Agri-tech.

Yorkshire and Humber region, three in the South West, one in the West Midlands, three in the South East and two in each of the East of England and Greater London⁴.

The largest cluster by number of business locations is London, followed by Bristol, Cheshire, and the Greater Manchester area. While the concentration of companies in London (272 business locations) could partly reflect a "headquarter effect," where registered addresses do not align with actual company development locations, the difference in the size of this cluster compared to the next three largest clusters—Bristol (171), Cheshire (157), and Greater Manchester (148)—does not strongly support a headquarter effect⁵. The smallest clusters are located in Oxfordshire, Yorkshire, Leicestershire, and Lincolnshire. Regional variations in public and private funding patterns remain evident across these clusters.

The Infrastructure Landscape for Agri-tech (Section 5)

The business clusters identified are served by a rich constellation of soft and physical infrastructure supporting Agri-tech activities across Technology Readiness Levels but with greater strength in lower TRLs, and more limited facilities supporting Agri-tech innovations closer to market.

We identified 106 infrastructure organisations; 39 of these provide soft support and mostly have a national focus, whereas the remaining 67 organisations provide physical facilities. Of these physical facilities, 49 (73%) focus on basic research or early-stage research translation, highlighting the lower levels of support available at high Technology Readiness Levels.

There is some regional variation in the availability of physical facilities. Below, we summarise our findings relating to the spatial distribution of the facilities we identify.

- » The North West/Greater Manchester and East Midlands regions have the fewest physical infrastructure facilities, with only one support organisation serving Research and early-stage Translation (TRL 1- TRL 3) in this region. This highlights a potential gap in support here at higher TRLs.
- » All other regions also have facilities supporting TRL 1- TRL 3. These Research and Translation infrastructure facilities are particularly prevalent in the East of England, the South East, the West Midlands, and the South West.
- » Most regions have at least one Translation and Demonstration facility (TRL3-TRL5); Scotland has two. Greater London is an exception, likely because its Demonstration and Commercialisation facility supports activities up to TRL 9.
- » Most regions also have a Demonstration and Commercialisation facility (TRL 5 to TRL 9). The exceptions are Northern Ireland and Wales, where there

⁴ Although there is infrastructure support for research and early-stage translation in Norwich, we do not identify a business cluster here based on the parameters of our approach.

⁵ Moreover, most companies identified have more than one registered location (see Section 4), and a strong headquarter effect would have resulted in a much larger London cluster.

appears to be a gap in providing facilities supporting late-stage demonstration and commercialisation.

- » The South West is home to the only Commercialisation and Scale-up infrastructure we identify, an Accelerator organisation that provides scale-up support (Science Creates).
- » Northern Ireland, Wales, the East of England, and the South West also have regional networks, which provide networking opportunities and bring together regional research and industry actors.

The findings suggest potential scope for infrastructure investment in the North West and the East Midlands regions. However, as will be discussed, findings from company interviews suggest a high degree of business mobility, with most businesses willing to travel to access relevant infrastructure. This indicates that geographical proximity to infrastructure organisations may be less important here. Nevertheless, strengthening infrastructure support for specific technology areas within clusters has the potential to support the overall growth of clusters. In addition, there are cross-cutting opportunities to enhance commercialisation support through the provision of higher TRL facilities; there appears to be a need for facilities which work with businesses beyond the demonstration and commercialisation stages to support scaling-up.

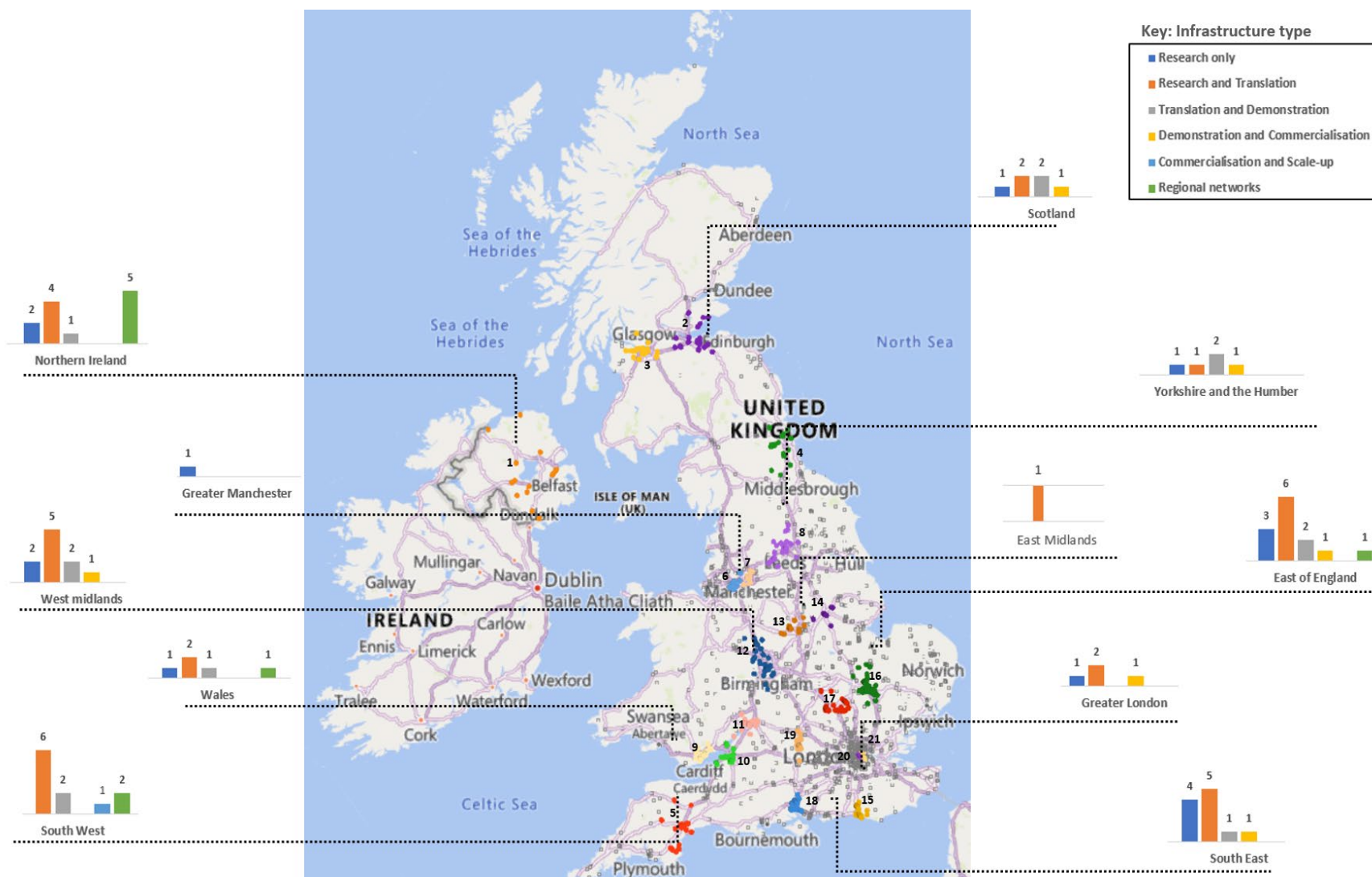


Figure 2: Geographical distribution of the Agri-tech infrastructure relative to business clusters

Perspectives of Industry Experts and Agri-tech Businesses on Infrastructure Provision and Commercialisation Challenges (Section 6)

Our in-depth interviews with 15 Agri-tech companies and 5 Agri-tech experts underscored the crucial role of funding and infrastructure support in enabling Agri-tech innovation. Businesses that have received support highlighted how financial support from Innovate UK and infrastructure support from the former Agri-Tech Centres⁶ were pivotal in alleviating financial pressures in their early stages of development and allowing the validation of their business models and technologies at later stages. Equally important, businesses also acknowledged the importance of softer support aspects, such as capacity building through mentorships and networking through workshops, conferences, and exhibitions.

However, our findings highlighted several commercialisation challenges faced by businesses in Agri-tech, many of which align with previous research. These are summarised below:

- » **Capital and Funding Challenges:** A predominant theme from the interviews is the difficulty in securing sufficient capital for scaling despite funding availability in the initial stages of innovation.
- » **Challenges in accessing government grants/initiatives:** Businesses and industry experts highlighted the complex and difficult funding application processes, unrealistic match-funding requirements, and exhaustive forecasting of future performance.
- » **Infrastructure constraints:** Some businesses, particularly in the crop gene editing sector (biotechnology), reported significant challenges posed by inadequate local infrastructure for testing and validating new technologies.
- » **Misaligned stakeholder expectations:** Various stakeholders in the sector—technology developers, farmers, investors, and academic institutions—have differing expectations about the nature of technologies, the speed with which they can be developed, and the returns on investment. This divergence serves as a significant barrier to collaboration and innovation.
- » **Perceived risk and low investor confidence:** The sector is perceived as being of high risk, partly due to uncertain timelines for returns on investment. The UK Agri-tech ecosystem also lacks a strong presence of large corporates investing in the sector, which is thought to limit the scale of investment.
- » **Issues around adoption and diffusion:** The low adoption and diffusion of Agri-tech innovations by farmers has emerged as an important barrier to the successful commercialisation and scaling-up of Agri-tech innovations. Various factors contribute to this, including the high cost of adoption for farmers, resistance from established industry networks whose members may wish to avoid adopting

⁶ Note that the Agri-Tech Centres- CHAP, Agri-EPI and CIEL- have now merged into a single UK Agri-Tech Centre.

technologies, informational barriers in identifying viable technologies, and a lack of early-stage collaboration between Agri-tech developers and farmers.

- » **Skills gaps:** There are notable skills gaps within Agri-tech businesses and in support organisations. There is a need for individuals with commercial expertise to assist in assessing grant funding applications.
- » **Inadequate policy coordination:** There is scope for better coordination between early-stage innovation support (like Innovate UK) and later-stage adoption support (such as through DEFRA)

Gaps and Investment Opportunities (Section 7)

Our analysis suggests five main investment opportunities that could strengthen the UK's commercialisation ecosystem for Agri-tech. Each opportunity reflects the triangulation of evidence from previous research on the sector, our own industry and infrastructure mapping, and discussions with Agri-tech businesses and industry experts. The main investment opportunities we have identified are as follows:

i.) **Physical infrastructure support**

Our findings identify two primary gaps in the physical infrastructure landscape for Agri-tech: weak infrastructure support for businesses looking to scale-up, and inadequate testing and validation facilities for businesses in the agricultural biotechnology segment of Agri-tech. This highlights a potential need for investment in higher TRL commercialisation and scale-up infrastructure across Agri-tech and mid- to high-TRL support for agricultural biotechnology. The latter issue is well documented for the biotechnology sector more broadly (see Jibril et al., 2023) and acknowledged in the 2023 [National Vision for Engineering Biology](#).

Additionally, our findings suggest the potential for **soft infrastructure organisations** to play a more significant role in helping to address the commercialisation and scale-up barriers identified. This suggests:

ii.) **Integrating soft infrastructure for collaborative investment and adoption models**

Businesses and industry experts identified high-risk perceptions as a critical inhibitor of both private investment into Agri-tech and investment by farmers to adopt Agri-tech. To address this, it may be beneficial to encourage private investors to collaborate on investing in technologies, which can help spread the risk. Similarly, farmers should be incentivised to collaborate in trialing technologies to spread the cost of adoption. While these types of collaborations may be happening, there appears to be an obvious need for expansion across the UK. In both cases, soft infrastructure, such as industry networks or Strategic Coordinating Organisations, such as Innovate UK Business Connect, can be key in promoting and facilitating collaborative investment and adoption models.

iii.) **Tiered funding options and greater flexibility in funding processes**

Businesses face significant challenges in obtaining funding at later stages of the innovation process. To address this issue, implementing tiered funding options tailored to the unique risks and requirements of later stage Agri-tech activities could help alleviate challenges and provide competitive access to funding for promising businesses with technologies closer to market readiness. This could be done through a dedicated Agri-tech investment support scheme designed to help firms de-risk commercialisation investment by providing competitive finance in return for a royalty payment on subsequent commercial sales. Our findings from the business landscape analysis indicate that businesses in Drone Technology and Precision Farming have relatively lower private investment, suggesting a potential scope for prioritisation of investment support⁷.

To tackle what are seen as the unrealistic requirements often associated with funding application processes, funding bodies should adopt a more flexible approach that prioritises milestones and iterative learning. This approach reflects the dynamic nature of agricultural practices and the inherent uncertainties that technology developers and farmers' encounter. Again, this highlights a key role for soft infrastructure, particularly funding organisations.

iv.) **A national Agri-tech roadmap and technology directory**

Industry experts we engaged with emphasised the need for a national strategic plan or roadmap for agri-tech that could help provide a clear direction for the sector⁸. This is likely to increase investor confidence by providing a sense of longer-term strategic support for priority areas but is also expected to boost adoption rates if farmers are convinced of the overall direction of travel for the sector. This suggests a gap in the '*system guidance*' function that ought to be carried out by Ecosystem-Enabling Organisations such as DEFRA and Innovate UK.

Related to this, due to the heterogeneity of agricultural technologies and the fragmentation in farm use cases, developing a directory of recommended types of technologies for specific but broadly relevant crop variants and use conditions would be fruitful. This should have some legitimacy, and technology choices should be transparent and evidence-based. This may operate as a 'Which guide to' agricultural technologies, and is yet another area where soft infrastructure, through Strategic Coordinating Organisations that have a convening power within the industry, can play a vital role. There is a potential role here for the new UK Agri-Tech Centre.⁹

⁷ Careful implementation of funding reforms is of course necessary to ensure compliance with State Aid rules, which the UK is bound to despite Brexit.

⁸ The [UK Agri-Tech Industrial Strategy](#) is over a decade old.

⁹ Previous attempts have been made through a proposed National Agri-Tech Innovation Platform (NAIP) which included Rothamsted Research and other organisations. Among other things, NIAP proposed to serve as a connector of various infrastructure and provide a one-stop window into UK innovations

v.) Financial and engagement support for Agri-tech adoption

Various businesses and experts interviewed indicated that farmers find it prohibitively expensive to adopt effective technologies, and existing support is insufficient to promote widespread adoption. More efforts are needed to help facilitate trials or provide additional grant support to farmers for testing new technologies with potential positive implications for Agri-tech scale-up.

Additionally, while IUK and DEFRA already collaborate via the Farming Innovation Programme, other areas for better coordination between the two organizations should be explored, wherein IUK support technology development, and DEFRA provides continuity through supporting adoption and diffusion. Identifying market-ready technologies for field testing support appears crucial for bridging the gap between development, commercialisation, adoption and diffusion.

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