CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

From Report to Reality:

Strategic Action Plan for the CPCA

October 2021

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EXECUTIVE SUMMARY

The CPCA geography is becoming globally renowned for agri-tech, and stakeholders across the agri-tech value chain are clear that the opportunity to build on this excellence should not be missed.

Key intervention areas for consideration resulting from the stakeholder consultation include (i) providing an **enabling environment for "agri-tech" business scale-up**, (ii) specific support for **de-risking technology adoption by farmers**, (iii) **skills development and augmentation** and (iv) accelerating the **journey to net zero.**

In addition, there is appetite to develop a clear understanding of the assets within the CPCA area and using this to support the ongoing engagement with neighbouring LEPs (particularly New Anglia LEP and Lincolnshire LEP) to develop (v) a **robust shared regional narrative for agri-tech** to present to the world**.** We also suggest a possible over-arching mechanism to enable greater leverage of the potential for **multi-disciplinary engagement around agri-tech**, to harness the synergies with other sectors such as health and life sciences, digital and advanced manufacturing.

We encourage caution so as not to conflate "*agri-tech*" with "*agriculture*" or the wider "*agri-food supply chain.*" For the purposes of this report, we have considered the agri-tech value chain to operate across fundamental and applied R&D and its commercial application on farm and in primary processing in packhouses, for example. Secondary processing (such as new product development by food companies, for example) is deemed out of scope.

Attempts have also been made to leverage or align with existing successful initiatives, rather than recreating or duplicating, or having entirely *de novo* inventions. Given the current pressures on the public purse, a parsimonious approach seems the most pragmatic, although some ideas are presented on which to potentially build business cases for higher cost interventions.

1. INTRODUCTION

Cambridgeshire & Peterborough Combined Authority (CPCA) undertook a piece of work to build on the high-level strategy plan developed by Promar, and to scope out elements of a Delivery Plan for submission to the Business Board in November 2021.

This report aims to provide some tangible, actional insights which build on the Promar report and reflect the views of a series of stakeholders (some of whom were consulted in the Promar work).

The wider context here is to provide a series of high level deliverables to inform the Business Board's recommendations to the CPCA for possible interventions, and to provide some insights on which to base future business cases.

2. THE WIDER AGRI-TECH CONTEXT

For six years the GCGP-LEP pioneered the Eastern Agri-Tech Growth Initiative, a UK-leading programme which has supported numerous R&D and Growth projects within individual SMEs, and also funded the development of the Eastern Agri-Tech Innovation Hub in Soham. This cemented its position as a UK leader in supporting agri-tech. The aim now is to identify a series of potential interventions to align within the future growth plans of the CPCA amid the current socio-economic climate of Covid Bounceback, transition to ELMS (following Brexit and changes to the Farm Business Support system), as well as ensuring alignment with the strategies within HMG, including the national Innovation Strate , the Food Plan, the 25 Year Environment Plan and others.

Other drivers also include changes to the national levy Board Agriculture and Horticulture Development Board where a recent ballot resulted in growers voting not to continue to pay the levy for R&D into potatoes and horticultural crops. (Other ballots may follow in other areas, which is likely to have an impact on knowledge exchange from research to practice). Finally, Defra is launching a tranche of funding via the Farming Innovation Pathway and this sits alongside the Innovate UK Industrial Strate Challe e Fund for "Transforming Food Production." A new wave of "Strength In Places" funding is also anticipated.

Finally, the Dasgupta Review (University of Cambridge, 2021) advocated an understanding of the economics of biodiversity, encouraging value creation and capture to be viewed in terms of natural capital and ecosystem services, in addition to the usual growth metrics. Agri-Tech is a key enabler of this approach, permitting measurement and management using, for example, remote sensing, earth observation, and data analytics (cornerstones of "agri-tech" innovations). The unique landscapes, (including the Fens, which are home to the majority of the UK's lowland peat soils) and natural capital assets in the CPCA geography mean it is ideally-placed to demonstrate global leadership by empowering agri-tech to advance this critical agenda alongside the widely recognised metrics of economic growth.

It should also be noted that while many of the issues identified are not unique to agriculture (access to scale-up support, for example), agri-tech innovation and adoption may be constrained by seasonality and variability of nature. This may mean that validation takes longer in other sectors and hence the enhanced need for public sector support to help de-risk the innovation and accelerate its pace to market.

Despite the national emphasis on "levelling up" across the UK, a key objective for the CPCA should be to build on the existing excellence as well as addressing the gaps and ensuring adherence to Green Book guidelines to both address market failure, and to reinforce and enhance the incumbent excellence. Where possible, some "levelling up" across the CPCA area might be desirable, to address the disparity in technology adoption, business creation and engagement with R&D across the farm businesses.

3. METHODOLOGY

Agri-TechE has been operating for 8 years in the Cambridgeshire-Peterborough geography, and also works closely with other LEP areas in the UK and other agri-tech clusters internationally. The Agri-TechE Director was also a member of the Programme Board for the Eastern Agri-Tech Growth Initiative, where additional localised industry intelligence was acquired. There is thus significant domain knowledge drawn from local, national and international experience.

This knowledge has been augmented with desk research, individual discussions with key stakeholders, and the hosting of a workshop (with associated pre-work) involving leaders in academia and industry who are based in the CPCA geography.

Delegates were requested to submit pre-work prior to the workshop, to help scope out areas in which there was a view that the CPCA would be able to make an impact and to identify areas of nationally differentiated excellence. The pre-work survey is in **Appendix 1**. At the workshop, delegates worked in groups to scope out various potential interventions in more detail, based around the template in **Appendix 2**. The recommendations are summarised in **Appendix 3,** along with an indicative scale of budget and priority.

4. RECOMMENDATIONS

A series of 14 possible interventions were identified by the groups at the workshop. While few of the suggestions were entirely novel, there is the unique CPCA lens through which they should be considered and potentially delivered. In many cases there are national efforts to tackle them either currently underway or with imminent delivery planned. However, the potential to align with, and be inspired by, national strategies and programmes is significant and has precedence with the Eastern Agri-Tech Growth Initiative which mirrored the interventions from the national agri-tech strate (2013). In addition, the fact that the stakeholders have highlighted them as potential interventions means there is a lack of awareness, or these interventions are not meeting the specific needs in the CPCA geography.

While the stakeholder ideas have been presented as a series of separate interventions addressing specific issues, they could also be envisaged sitting together within a new flagship vehicle – a (virtual) "**Centre for Inter-Disciplinarity for Agriculture and Land Management**." This centrally co-ordinated "hub-and-spoke" model would harness and unite the currently fragmented offerings across the CPCA geography, bringing them all together as delivery partners with the opportunity to collectively deliver impact. This Centre would be a repository of distributed existing facilities across the CPCA geography (some of which would require further capital investment in infrastructure and buildings), would provide access to finance, signposts to business support, introductions, and technology demonstration facilities. It would also provide a focal point to develop the interface between other industries (such as health and life sciences) into "agri-tech" across the CPCA geography.

The ideas from the stakeholders have been grouped into the following categories:

1. Supporting the scale-up of innovation businesses, providing access to grow-on and demonstration facilities, finance and end-users
2. Incentivising and de-risking farmer adoption of new technologies
3. Developing the skills agenda to help address the emerging and expanding needs of the industry as it collectively "up-skills"
4. Supporting the journey of "agri-tech" towards net zero; being mindful of the unique Fenland ecosystems and understanding how their management can contribute to net zero of the industry by 2040 (as recommended by the NFU).

In addition, Agri-TechE would like to make a recommendation around harnessing more effectively the unique multi-disciplinarity in the CPCA geography, ranging from life sciences, advanced manufacturing, digital, 3D printing, to earth science, materials science, ICT and telecoms, earth observation and software engineering. All of these disciplines are already contributing technologies and thinking to agriculture, and an inter-disciplinary "systems" approach is rapidly becoming recognised as the way to tackling the major challenges of climate change, increasing productivity and enhancing GVA. This aligns with the concept of the Centre for Inter-Disciplinarity.

We also would like to endorse the ongoing work around creation of a "regional narrative" for agri-tech, ensuring clarity of vision and understanding within the CPCA of the nationally differentiated assets within the region. This will feed into and support the wider Foreign Direct Investment activities underway within the CPCA and support the development of HPOs (High Potential Opportunities). At least one HPO within the CPCA area should be identified by Government.

RECOMMENDATION 1

Provide specific support for scale-up of businesses active in agri-tech – including facilities, access to finance and infrastructure support.

Support for start-up and early-stage agri-tech ventures is good in the CPCA area – there are incubators, accelerators and other mechanisms to incentivise and support business growth and there are a number of examples where this has been successful (e.g. Dogtooth Robotics, Agri-Grub, Smartbell, Yagro and others).

Scale-up, however, is more challenging, especially if specialist facilities are needed. Access to growth finance is also more challenging – investors are also particularly reluctant where intensive capital costs are associated with scale-up.

Workshop delegates suggested drawing inspiration from the "Engine" model associated with MIT in the US, to provide and encourage larger businesses to enter into a public-private partnership with CPCA and provide long-term "patient" capital and access to facilities. There are a number of entities across the region who are either delivering some part of this, or have aspirations to do so. A distributed model across a number of entities would reduce competition and provide a more joined-up "offer" to businesses and as an FDI narrative. A new central bricks-and-mortar facility is not what is needed – existing assets can be leveraged and enhanced.

Other models such as that developed by the Western Growers Association in California provide grower-funded access for start-ups and cash to make their innovations useable in large grower environments.

Suggested actions include:

- Undertake an audit of the existing and planned facilities for scale-up of agri-tech businesses in the region, identifying gaps and opportunities.
- Create a "hub-and-spoke" model by collating and, where necessary, investing in existing facilities (e.g. Eastern Agri-Tech Innovation Hub, Barn 4 – both of which have been CPCA investments - Caxton Manor Farm plans, Bury Lane Farms, University of Peterborough campus) to provide workshop / forklift / trials facilities to provide the necessary grow-on and scale-up space and technology validation.
- Creation of a suite of flexible growth capital options – such as grants, convertible loans, asset finance – potentially co-investing with other private sector investors (there is precedent for this co-investment model in New Anglia LEP) to emulate the Engine model with MIT.
- Provision of a tailored offering of business support, to include, potentially, innovation vouchers, export advice, mentoring and signposting – ensuring the "agri-tech literacy" of the existing Growth Works offering with dedicated, credible agri-tech advisors to help businesses access existing national support as well as new local initiatives specific to the CPCA.
- Ensure agri-tech needs are considered alongside other infrastructure planning around the CPCA area – such as access to 5G, rural broadband, affordable housing and transport to work (given that many businesses are remote across the geography).

RECOMMENDATION 2

Increase the rate of adoption of new agricultural technologies by farmers through de-risking investment and providing support for academic-industry support.

A number of schemes already exist for this, not least the Industrial Partnership Award, Stand Alone LINK grant (both offered by BBSRC), the Knowledge Transfer Partnership (Innovate UK), Smart Grants, Transforming Food Production Programme and the pending Farming Innovation Pathway programme being rolled out by Defra. These, however, are either not well understood or highly competitive, or with a few exceptions, are not bespoke to agri-tech. The Ceres fund (hosted by the University of Cambridge has had some successes, but an independent evaluation should be undertaken to establish its impact).

The CPCA has an excellent track record in providing access to flexible, enabling support through the Eastern Agri-Tech Growth Initiative and it is suggested that this is augmented to provide a wider suite of support across the Technology Readiness Levels and to companies as they grow.

Suggested actions include:

- A regionally-contexualised grant scheme which builds on the flexible Eastern Agri-Tech Growth Initiative for R&D and business growth, but is significantly expanded to also support collaborative R&D and have a lighter administrative burden, higher intervention rate and greater chance of success than the national schemes. This should encompass small interventions (such as an innovation voucher scheme to the value of £5-10k), larger R&D projects (£20k - £150k) and larger programme investments up to £250k).
- A fund, inspired by the Defra Countryside Productivity Small Grant Scheme, to help farm businesses with procurement and investment of specific new technologies for adoption, to help fund trials work and de-risk farmer investment.
- This fund could also be part of an incubator/accelerator fund for introducing researchers and small start-ups to big agri-businesses to provide additional pull to market.

RECOMMENDATION 3

Ensuring a fit-for-purpose workforce for an agri-tech enabled industry, providing life-long learning opportunities, re-skilling and up-skilling.

The skills and labour issue in agriculture is well-documented and being considered at a national level as part of the national Food and Drink Sector Council. In the CPCA geography, however, there is a disparity in skills from PhD level to vocational and seasonal work around agriculture and agri-tech. There are a number of regional HE and FE delivery partners and, like their counterparts across the wider UK, are reflecting on how to offer courses and skills programmes to prepare the workforce for 21st Century agriculture. Agri-tech of course forms a key part of that.

This is, however, operating against a competitive backdrop nationally, with many other FE and HE centres having similar thoughts. There is little point in recreating offerings which will be competing for an already small pool of learners – bespoke offerings for the businesses and learners in the CPCA area is what is needed. There are a number of industry-led providers – such as ARTIS programme which currently exists to provide flexible learning in some areas of the industry – any future plans should be considered within the context of this and other initiatives.

Suggested actions include:

- A detailed skills plan bespoke to agri-tech in the CPCA geography is needed, sitting alongside a wider skills plan for food, drink and agriculture. Agri-Tech is the underpinning enabler through which new skills can be developed and higher value jobs will be created for agri-food, and will undoubtedly require different types of training. This needs consideration alongside the existing training offerings in the CPCA region from FE and HE and within the private sector.
- The stated goodwill of employers to help provide industry placements, host apprenticeships, internships and studentships should be harnessed in a structured way to provide sight of new opportunities for learners. This should sit alongside other schemes underway within the local authorities such as the Cambridgeshire and Peterborough Re on of Learning programme and Form The Future.

RECOMMENDATION 4

Harnessing agri-Tech as an enabler for the Net Zero journey in the CPCA geography

The high quality Fenland peat soils have underpinned the agricultural productivity in the CPCA region. There is, however, serious pressure to reduce GHG emissions from the industry and those resulting from agricultural production are significant, in particular soil inversion (through ploughing) and use of fertilisers. The Fens are particularly vulnerable to this and technology can play a key role in helping model different cropping and land management scenarios, creating digital twins, helping to understand how bio-pesticides and bio-inspired crop and animal management regimes can contribute to the net zero journey set by HMG. No other geography has both the challenge and potential solution at its disposal.

Understanding Fenland agriculture and how to best manage the landscape is not necessarily within the scope of this piece of work, and there are numerous initiatives underway to identify interventions. However the CPCA can take a leadership position enabling agri-tech to support the journey to net zero by incentivising and deploying use of technologies to help address the challenges.

Suggested actions include:

- A life cycle analysis of Fenland agriculture with modelling to understand better specific interventions which would reduce GHG emissions
- Creation of a digital twin of the Fens to model the impact of potential agri-tech interventions to reduce GHG.
- Financial support to sit alongside ELMS – potentially leveraging the County Farms network as a test-bed – to demonstrate different agri-tech solutions and their role in lowland peat GHG management.
- Grant incentives for roll-out of the necessary infrastructure and upgrading of farm real estate to support an electric or renewable energy platform and battery storage.

RECOMMENDATION 5

Develop a clear positioning around the "agri-tech" capacity and assets in the CPCA geography and ensure these are well-understood and embedded across all communications.

As highlighted by workshop delegates, these include – but are not limited to:

- ✓ **Highly productive arable agriculture** with a high concentration of vegetables, salads and ornamentals, particularly in the west and north west of the region.
- ✓ **A rich local research and development community**, in particular in plant science, based in and around world-leading institutions.
- ✓ **Seed & early stage funding**, provided by an engaged community of Angels & VCs with a track record in investment in agri-tech.
- ✓ **Enabling local government**, demonstrated by ongoing pro-active support for agri-tech from CPCA.
- ✓ **Excellence in technology**, in particular robotics and machine vision, as shown by the quality of businesses found in the region and in Cambridge in particular.
- ✓ **Excellent collaborative and cross-discipline R&D in agri-tech** (in a range of sectors), and strong links between academia and industry, particularly in horticulture (as evidenced by NIAB's work).
- ✓ **Agricultural and horticultural diversity**, reflected in the wide range of edible and non-food crops grown in the area.
- ✓ **Expertise in climate science and sustainability** in Cambridge University, Anglia Ruskin University and the businesses in the area.

No other UK geography can claim this suite of excellence. They should form the basis of much wider positioning and an inward investment "story" around agri-tech which links to a wider regional narrative with neighbouring LEPs of New Anglia and Lincolnshire.

Suggested actions include:

1. Refresh the "smart specialisation" approach to the agri-tech assets in the CPCA area (last undertaken in 2015).
2. Embed the agri-tech narrative more visibly within the wider CPCA inward investment "offer."
3. Develop a pro-active approach to external communications of the excellence on offer, promoting specifically the market "pull", technology capacity and strengths of the region.
4. Identify and attend global events and explore opportunities to engage with others to promote the CPCA agri-tech competencies and assets internationally.

5. CONSEQUENCES OF FAILURE TO ACT

Workshop participants were asked to reflect on the consequences of not undertaking the various suggested interventions. In almost all cases the consequence was loss of economic competitive advantage, "being left behind globally," a lack of skilled people (or at worst a "brain-drain" of the few with the skills) and missed opportunities to leverage effectively the unique assets in the CPCA area, such as the links between agriculture, health, sustainability and climate change.

In the UK there are other areas investing heavily in agri-tech (such as Lincolnshire, Shropshire, the South West), and globally clusters such as the Research Triangle Park in North Carolina, The Food Valley around Wageningen in the Netherlands, and the Greater St Louis area in Missouri are all making global waves about their geographies. They are seeking partnerships with Agri-TechE to help engage with the wider UK cluster via the portal of the East of England – the narrative from this region needs to be equally as ambitious.

5. CONCLUSION

The agri-tech asset of the CPCA geography is truly unique and the Promar report provided valuable market intelligence to help inform future business cases for additional investment. There is an ambition to raise the bar higher, to "level-up" across the CPCA geography with access to technology, de-risking investment in new tools and services, and to support the contribution made to a reduction in GHG emissions and natural capital acquisition via deployment of agri-tech.

APPENDIX 1 Pre-work questions

A questionnaire on Microsoft Forms was emailed to all workshop delegates in advance of the workshop, setting out the context of the exercise and asking the following questions:

1. Nationally Differentiated Strengths and Excellence in the CPCA region

QUESTION: "We know we 'do' farming, research, and tech really well here, but where - specifically - do we stand above other parts of the UK?"

Respondents were invited to submit up to four 'strengths' and provide context and examples for each.

See data under Recommendation 5.

2. Gaps: Areas for development

QUESTION: "Where do we have the potential, or need, to grow and develop in order to more fully support agricultural and horticultural technology?"

Respondents were invited to submit up to four 'opportunities or needs' and provide context and examples for each.

- **Supporting (including via increased private sector funding) the scaling-up and adoption of agri-tech innovation**, to support improved uptake by farmers of new technologies to help tackle environmental challenges
- **Better collaboration between, and training for, farming businesses** to support innovation and technology adoption
- **Space for innovation and development**, including more incubators and improved facilities for larger, developing businesses
- **Improved connections to drive commercialisation** of Cambridge's research expertise in sustainability innovation
- **Better integration for start-ups with existing agricultural machinery manufacturers**
- **New partnerships to commercialise and exploit existing tech capabilities**
- **Breaking down the sector barriers** between existing networks, partnership and groups, and enhancing connections to expertise outside the area
- **Increased short-term funding opportunities** to support collaborative projects between universities and businesses
- **Automation and robotics to support increased productivity** and help mitigate for labour shortages
- **Application of Cambridge's existing expertise to support supply chain technologies** to streamline the food chain, reduce C emissions and meet changing consumer demand

3. Interdependencies and linkages

QUESTION: “Thinking about the CPCA's strengths you've identified above (and any gaps or opportunities), do any of these have interdependencies or close linkages with other sectors or industries, or other geographies (UK or abroad)?”

Respondents were invited to describe any interdependencies or linkages.

- The **described strengths will benefit other non-agri-food businesses**. However, the area's general economic strengths put **upward pressure on salaries and property costs** which can be damaging for agriculture
- Agri-food in the area has **strong links to environmental and climate sciences**, as well as a wide range of technology capability here
- Strong potential to **link Cambridge to other leading regional research institutions** (UEA, Lincoln, Cranfield, Rothamsted etc.) to create a globally competitive combined regional powerhouse
- What connections already exist, and how can these be strengthened, between the CPCA region and **neighbouring areas** such as Lincolnshire?
- What linkages exist or can be created between **recent efficiency gains in the distribution sector and on-farm harvest and labour allocation** in the horticulture industry?

4. What would have the biggest impact for agri-tech?

QUESTION: “Finally, what single intervention or action you would like to see the CPCA implement to advance “agri-tech” as part of its strategy? This can be wildly ambitious, or highly practical (or both) – we are keen to capture all thoughts and ideas.”

Respondents were invited to name their chosen intervention and explain the reason/s for it.

- **We need to think big, and much bigger than what has been delivered to date**. We should make use of the opportunity for private investment of a business park dedicated to agri-tech to bring industry together with research to commercialise new technologies, and to create something of local, national and global significance.
- **Financially incentivise local companies to mitigate and / or sequester GHG emissions**. By acting boldly with its agricultural community, coupled with the area's existing strengths, CPCA could become the first UK region to reach agricultural Net Zero.
- **Incentivise farmers and growers to be early adopters** including through stimulating greater farmer-farmer collaboration to increase tech adoption by reducing cost and risk.
- **Attract more private capital investment** including by attracting and educating investors with less agri & agri-tech knowledge.
- **Increase availability of seed funding for those producers** collaborating with researchers or tech companies.
- **Bridge the gap between UKRI funded research and established equipment** used by growers. See Western Growers Innovation Centre in Salinas, CA as an example.