

The Future of SRUC in North East Fife
A Report for SRUC
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“A wise man apportions his beliefs to the evidence.”
— David Hume —

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1. Executive summary

Report purpose

- 1.1 There has never been a greater need for a strong educational and research representation in Scotland to support and champion the land-based industries. SRUC has been established to fulfil this need by supporting both further and higher education (FE and HE), and both research and innovation. Not only is there a need to ensure that Scotland's food production system is serving the best interests of Scotland's people, other functions of land which also provide services to people are increasing in importance. Scotland needs skilled people to work in this 'land-based' sector of the economy and they need to be trained, retrained and developed throughout their careers.
- 1.2 The purpose of this inquiry and report has been to present a compelling vision for SRUC, focussed on its interests in NE Fife, but this necessarily requires consideration of how such a vision fits with a bigger picture of how land-based industries on a Scotland-wide basis are supported by research, innovation and education. I come to this subject with no personal interests in the outcome, an open mind and no pre-conceptions other than those based on my experience of working as a research scientist, a science adviser to government and as an experienced governor of public and private sector institutions and charities. The report is, as much as possible, an independent view.
- 1.3 This report has been commissioned by SRUC itself because it is interested in how it should develop its presence in NE Fife. The Elmwood Campus, which it operates in Cupar, has been in decline having once been one of the most highly rated further education (FE) colleges in Scotland. The start of this decline appears to pre-date SRUC's custodianship of Elmwood which began in 2012.
- 1.4 This report also builds on SRUC's recently published strategy. Many aspects of this strategy provide a constructive foundation for the future and I am aware that planning for implementation is underway. Some areas of the strategy could be clearer about definitions, scope and ambition as well as what can realistically be achieved. I hope that this report will help SRUC to address these issues.
- 1.5 There is a wide breadth of opinion about what has caused the issues which have surfaced in NE Fife, and about the best path ahead. My conclusions will, therefore, inevitably be out of tune with the opinions of some people but I hope that those conclusions can at least be seen as logical, based on the evidence and a stimulus for positive actions.

General conclusions

- 1.6 I am left with two very clear general conclusions:
 - a) That the people of NE Fife need locally-supplied further education (FE). They have been let down by systemic failure¹ within the education system. Several institutions, including SRUC, need to collectively work to correct this situation. If they allow the

¹ Systemic failure happens when individual components of a system act rationally and in their own interests but when the collective outcome is negative or adverse as measured by the originating purpose or function of the system itself.

current situation to continue, they fail in their public duty by shifting their risk (and its consequences) onto some of the most vulnerable people in society and they fail many others.

- b) That the people of Scotland need a strong, internationally-credible educational and research institution to support its land-based economy, that the opportunities exemplified by NE Fife are significantly under-exploited to achieve this, and that there is an urgent need to transform SRUC into this institution. This is not just something which is ‘nice-to-have’; it is an essential part of the Scottish national infrastructure to ensure future national welfare, security and resilience².

- 1.7 It is, therefore, essential that SRUC is able to step up to meet both these challenges, to play its full part in restoring FE provision to NE Fife and, in concert with this, to become the leadership organisation which is tasked to deliver nationally-important outcomes. Noting that SRUC is not the specific organisation responsible for FE provision in NE Fife (see Para 4.40b) or other regions, SRUC cannot do this on its own and it needs to work closely with other institutions, including national and local government and other research and educational establishments. As stated in its charitable objectives, it needs to “expand research and education capacity in relation to the Natural Economy, [by] developing stronger partnership working between all stakeholders including public bodies”. Fully delivering on this will need changes to how SRUC perceives itself, including its purpose, and to how it conducts some critical aspects of its business.

Transforming SRUC

- 1.8 In the 14 years since its creation SRUC has broadly operated with the culture and systems of the component institutions used in its formation. In this time, SRUC has built undoubted strengths and has had notable successes, but there is a need for an institutional transformation to settle on a solution relevant not just to NE Fife, or the few other regions in which SRUC currently has a presence, but to all other regions of Scotland.
- 1.9 This transformation should address the problem that, by any measure, SRUC is a small university/college, teaching a proportionately small number of students across a huge range of student abilities on a dispersed estate much of which is effectively at end of life. All of this adds costs and is like a millstone which compromises its capacity to deliver its mission. In addition, the government formulas used to fund SRUC do not pay for these costs, and I see no reason why they necessarily should pay them. Since public funding is unlikely to increase, SRUC needs to cut its cloth to fit to this particular market, but this should not stand in the way of an ambitious plan for the future.
- 1.10 My conclusions based on a foresight analysis were that in future:
- a) SRUC needs to be a highly agile institution which fully embraces rapidly changing and technologically-driven work practices and have a laser focus on ensuring people can be helped to adapt to a rapidly changing world.
 - b) SRUC should be an institution to help create a better local food production system in Scotland.

² These issues are raised in Scotland’s National Good Food Nation Plan.

<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2024/01/national-good-food-nation-plan/documents/national-good-food-nation-plan/national-good-food-nation-plan/govscot%3Adocument/national-good-food-nation-plan.pdf>

- c) SRUC should be the leadership organisation to ensure that the need for “green” skills and knowledge is constructed as a pipeline supporting both technical and policy innovation.

There is no other candidate organisation in Scotland which is constituted to meet these needs. Perhaps a successful internal example to follow is the kind of education, research and innovation hub which the Dutch have developed at the Wageningen University & Research (WUR).

- 1.11 Some developments happening within SRUC seem to reflect opportunism or *ad hoc* process rather than building the charity to a plan which allows rapid assessment of the value brought by different opportunities. In the absence of such a plan it can appear that SRUC is simply chasing the money. While understandable, this can lead to the pursuit of opportunities which are not grounded in a sound strategic rationale and I think this has been evident in SRUC. It explains much about what has happened in NE Fife.
- 1.12 SRUC should draw a big, rich, strategic picture – a narrative about the future of agricultural industries in Scotland – which is realistic about what is changing in the world around Scotland, does not dwell on the past or tradition, but aims to pull a struggling and declining agricultural industry in Scotland up by its bootstraps and helps it to look to the future. SRUC needs to explain, to itself and to the rest of the world, how it fits into this picture alongside other organisations each of which have their own roles. SRUC’s mission should be to make the effectiveness of the whole Scotland-wide effort much bigger than the sum of its parts by helping other institutions to align with the strategic picture. If it does these things then funding to support it will flow. It is big visions with open ended possibilities, rooted in creating public good, and emphatically *not* in institutional self-interest, which will support successful applications to major public and private funds.
- 1.13 To this end, SRUC should create this vision as a community-wide project using methods which strongly discount the interests of people in the present and which focus on the needs of people in one or two generations from now. I have illustrated in this report the kind of foresighting needed to achieve this. It then needs to decide what its own institutional contribution will be in this future and map a pathway from its current institutional state towards a preferred future institutional state, including the infrastructure and people it needs to achieve the vision. My guess is that this will be very different to how SRUC looks now but this process is essential so that SRUC can carry everybody (employees as well as stakeholders) with it.

NE Fife presence

- 1.14 NE Fife is part of this picture of transformation and could be a testing ground for SRUC. There, the solution most probably lies in leveraging on the collective interest among local businesses, charities, public institutions and community organisations, all of which are active in the region. SRUC needs to be both a participant and a trusted convener. If SRUC is willing to invest, alongside other institutions which hold joint responsibility, then there is a reasonable probability that all these interests can be helped to act in unison. If this happens Elmwood will then have a secure and vibrant future, although it will probably look quite different from the ‘old’ Elmwood.

- 1.15 Some of the criticism about SRUC's role in the decline of Elmwood has been unfair, but SRUC itself has conducted its business in NE Fife in a manner which has resulted in a lot of hostility within the community. SRUC inherited much of the problem when it took on Elmwood. Other institutions which have greater responsibility for FE provision in NE Fife than SRUC have been suspiciously unengaged. Unlike Elmwood College, its predecessor, SRUC is not a social enterprise and it has not been provided with the funding to operate Elmwood in the form which many people would wish and which some expect. It has no contractual obligation to the region. However, it has sometimes taken a very narrow view of its responsibilities and therefore been content to gradually withdraw support for courses at Elmwood without working sufficiently to seek alternatives or to alleviate the community impact of its actions.
- 1.16 Internal disagreements in SRUC about what to do with Elmwood have never been properly resolved and, as a result, SRUC has never been clear, either internally or externally, about its intentions. If SRUC does only one thing in response to the report, it is that it should be clear about its intentions and back them up with positive actions.
- 1.17 Any solution for Elmwood must be nested within SRUC's wider plan which properly assesses the strategic opportunities brought if SRUC has a focus on the NE Fife region. While NE Fife is not by any means the only region of Scotland where there is strong potential in its land-based industries, it is a microcosm of the different industrial interests which are likely to shape the future of Scotland's land-based industries. NE Fife also has specific features which SRUC has significantly undervalued, despite having clear competitive advantage and market position, and which could give SRUC its much-vaunted international profile. NE Fife's potential as the fundamental feedstock for research and education in land-based industries of the future seems to have been overlooked by SRUC.
- 1.18 Consequently, if SRUC decides to retain an interest in NE Fife, it needs to do this with purpose and it needs to invest in both convening and supporting and, possibly, in capital infrastructure. My own view is that SRUC should retain and grow its interest in NE Fife because of the strength of the economic development opportunities which are present in that region and SRUC's strong alignment with those opportunities.

Methods of engagement and development in future

- 1.19 In general, SRUC needs to be much better at offsetting its own size and reach limitations by using the current FE and HE infrastructures in Scotland, in partnership. For example, SRUC should *not* be competing with other regional FE colleges which *de facto* have responsibility for regional FE provision. Instead, it should be supporting them and partnering with them to ensure that there are appropriate teaching skills and infrastructure which, because of its costs, might need to be shared. I also consider that this kind of approach is needed so that SRUC can operate effectively with HE institutions and private- and other third-sector organisations. Scotland is replete with FE and HE institutions many of which, like SRUC, struggle to operate so SRUC should be working to alleviate rather than exacerbate pain within this system. Competition within this system is toxic and SRUC should be doing all it can to minimise this. SRUC should be seeing many of these other institutions as components of its shared delivery mechanisms for its bigger objectives.
- 1.20 It is important that, as an independent charity, SRUC builds a proper contractual relationship with the Scottish Funding Council for the services it provides. At present,

these appear to be built on and outcome agreement but this clearly fails to expose serious anomalies in the way in which SRUC receives public funding.

- 1.21 My inquiries suggest that SRUC tends not to be the place of choice for excellent students who want to study agriculture. I believe it is essential that Scotland delivers an internationally top-quality graduate education in agriculture. SRUC can do this but probably not on its own.
- 1.22 SRUC is going to have to explore different types of business engineering to make partnerships work and the case of NE Fife can be a starting point for this. Partnerships need to be mutually beneficial and built using well-established business structures to establish governance discipline and appropriate distribution of risk and reward.
- 1.23 These businesses would not just be there to provide education; they could also support innovation across the land-based sector. . Much of the land-based sector is starved of abundant private capital because it does not present an expansive go-head vision and it fails competitively as a viable investment proposition. SRUC is already actively pursuing ventures of this kind and it is essential that SRUC continues to translate its strategic ambitions to changes on the ground in the form of compelling investment propositions which will attract private capital.
- 1.24 Built on its interest in producing high quality graduates in land-based subjects, at masters and PhD level, SRUC should be activating an innovation system across all of Scotland, but it could start this process regionally within NE Fife. It should be using its degree-awarding powers to ensure appropriate quality control among a wide range of private, semi-public and charitable organisations supplying FE services across Scotland. It should apply an agile approach: ‘start small, stay small, think big, act big’. But SRUC needs to do this to a plan which everybody knows about, sees and can participate in.
- 1.25 As a first step, SRUC needs to invest in the people who can lead this revolution and they should be based in NE Fife because I propose that is where this revolution should start. A second step should be to establish a “project group” involving SFC, Fife College, Dundee & Angus College, SRUC and Fife Council to crack the problem of FE provision needed in NE Fife³. This group should produce a master plan for the Elmwood site (among other tasks) and it should be accompanied by a “consultative group” made up of community representatives whose job would be to provide community support for, and to monitor the progress made by, the “project group” and to report this to Parliament whose job it is to hold to account the public bodies involved.
- 1.26 It is essential that this happens in a spirit of positivity and renewal. A third step would be to unlock the latent talent already present within the SRUC staff at Elmwood to support them with developing and funding business cases for expansion of their courses, and to ensure they receive appropriate remuneration for their efforts⁴. A fourth step would be to

³ I appreciate that it takes other organisations to share SRUC’s wish to find a solution and this may not be easy. However, it is for SRUC to be persuasive, and to lead by exploring new and imaginative structural solutions to the dilemmas facing Scottish further and higher education. Most will eventually participate if they understand there is a new prospect for them and they are likely to lose out, either financially or reputationally (but probably both), by failing to participate.

⁴ SRUC needs to consider how it ensures staff who come forward with business ideas are rewarded by sharing in their success. It is a common, and regressive, feature of Scottish FE and HE that it almost

develop business cases which address several key areas for investment in research and innovation. Initial suggestions for these are:

- a) AI to improve agricultural productivity;
- b) Agricultural robotics with a particular focus on local horticultural industry needs in the region of Fife and Angus;
- c) Innovations in food manufacturing⁵ to address a global problem of the trade-off which currently exists between the production of food and quality of the environment;
- d) Growing capability in countryside management for recreation including (but not exclusively) a focus on the sustainability of golf; and
- e) Agricultural systems efficiency assessment.

- 1.27 A final step should be to ensure this model of operation is replicated across the whole of SRUC.
- 1.28 SRUC should construct these business cases around raising both private and public capital and investment. It should consider using its own saleable assets to ensure it has starting capital available to invest itself and which can act as leverage to access further public and private capital funding. In addition, SRUC needs to consider how it can borrow against its current assets. SRUC needs to transition from an organisation where capital is, in general, stuck within fixed assets to one where it has considerably greater liquidity to allow it to invest in emerging opportunities in education, research and innovation.
- 1.29 SRUC already operates a ‘group’ company structure and is working to mature this. I see this as very positive and it is possibly the most distinctive feature of SRUC as an HE/FE institution. I strongly support building on this experience as a mechanism for building partnerships in future with both public and private institutions. SRUC’s current businesses broadly align with its charitable functions, but SRUC needs to assess whether they do enough to advance SRUC’s interests in their current form especially when assessed against other ways of using the capital value they contain.
- 1.30 Since SRUC has inherited most of these assets (including the site at Elmwood) which were once publicly owned, it should probably treat any proceeds from their sale as a restricted fund. I recommend SRUC should use this to start building an endowment to support its future core funding and that such a fund should be structured to be immune from funding operational deficits. This could take some time to accumulate but it is important that SRUC works towards being much less dependent on public funding to support its basic existence and needs.
- 1.31 If SRUC adopts a fully developed ‘group’ structure it will be breaking the mould of what a modern university is, something it alludes to in its current strategy but never defines. Arguably, the traditional university model is failing so this is a good time to adopt a different approach. A ‘group’ structure would see most revenues sitting within subsidiaries and many subsidiaries will be operated in partnership with other organisations. This maximises SRUC’s reach while minimising the capital infrastructure and human resource costs, and it limits risk.

universally fails to reward enterprising individuals. The incentivisation system needs to change radically if the FE/HE sector is to thrive and SRUC should create radical solutions to change this system.

⁵ Not that this is distinct from ‘vertical framing’ which it should not be confused with.

- 1.32 Future revenues for SRUC, as a charity, could then be built around a model which (a) charges a management overhead for delivering HE and FE in key subject areas mostly through third party suppliers; (b) charges a management overhead on innovation projects; (c) receives grant-in-aid for research from a broad range of sponsors which normally only deal with charities; (d) licencing of intellectual property (IP); and (e) dividends and capital sales receipts from business ventures. In the long-term, philanthropy might be a viable source of some funding, especially to support student scholarships.
- 1.33 If this vision for SRUC seems close to establishing it as an investment vehicle for Scottish land-based industries, then that impression would not be far wrong. Getting this structure right is essential before SRUC can look forward with confidence and to building a positive presence in NE Fife.

2. Recommendations

Recommendation 1: SRUC should recognise that its current legacy structures are not serving it well. It should adopt a lean (start small, stay small, think big, act big) approach to its business development and it should build this out from the solutions it develops in NE Fife. It needs to add to its agility by realising, and reinvesting, the value of many of its fixed assets.

Recommendation 2: Building on suggestions in this report and a strategic assessment of what SRUC can contribute to the health and welfare of the people of Scotland, SRUC should produce a plan for agricultural growth in Scotland, built around a strategic business case for an ambitious medium- to long-term investment in NE Fife, with a view to accelerating SRUC's ambition to be Scotland's leadership organisation in land-based education and research. It also needs to do this in collaboration rather than in competition with other relevant organisations while never being distracted from planning for the people of the future rather than of the present or the recent past. It is about raising the future game for everybody, not just SRUC.

Recommendation 3: More immediately, SRUC needs to invest in Elmwood by employing leadership there who can ensure that its staff there are properly cared for but who can also perform four essential functions:

- (a) Convene a 'project group' involving SFC, Fife College, Dundee and Angus College, SRUC and Fife Council which will develop a plan for future investment in Elmwood as an FE institute. This group should eventually transition to become the company responsible for operating Elmwood.**
- (b) Ensure that a 'consultative group' from the NE Fife community is convened to oversee and report (ideally to Parliament) on the progress made by the 'project group'.**
- (c) Help staff currently at Elmwood build business investment cases for the development of new courses.**
- (d) Develop and invest in business cases to pursue research and innovation, possibly focussing in five key areas, namely:**
 - i. AI to improve agricultural productivity;**
 - ii. Agricultural robotics with a particular focus on local horticultural industry needs in the region of Fife and Angus;**

- iii. **Innovations in food manufacturing to address a global problem of the trade-off which currently exists between the production of food and quality of the environment;**
- iv. **Growing capability in countryside management for recreation including (but not exclusively) a focus on the sustainability of golf; and**
- v. **Agricultural systems efficiency assessment.**

Recommendation 4: After developing a realistically-grounded understanding of future challenges, SRUC should continue to evolve and refine its strategy and associated delivery processes. It should map SRUC's shape and activities to pathways for achieving verifiable outcomes which match to the challenges.

Recommendation 5: SRUC should consider adopting a fully-implemented 'group' company structure and associated governance mechanisms, with the SRUC charity at its centre. It should use this to ensure that it has a strong focus on a future which maximises partnership working and access to private investment while continuing to support public benefit. .

Recommendation 6: As an independent charity, SRUC should normalise its contractual relationship with SFC for the services it provides so that the proper costs of those services, as well as the benefits they provide, are exposed to scrutiny.

3. Introduction

Preamble

- 3.1 This report concerns the future development of the presence of Scotland's Rural University College (SRUC) in North East Fife, focussed on Elmwood in Cupar. SRUC has committed to sustaining its presence at Elmwood so the aim of the report is to build a picture of the options available for its future development as an asset which helps to develop the economic life of the region (see Appendix 1 for the Terms of Reference).
- 3.2 However, I have found it impossible to undertake this task without dilating my focus to the bigger picture associated with SRUC's structure and function. This harps back to the initial rationale for creating SRUC, which I have found to be a source of many of the current issues which SRUC is grappling with in NE Fife.
- 3.3 I start by setting out the assumptions, principles and audiences addressed in this report. If, on occasion, there is a tone of criticism in some of my comments, this should not be a surprise. The very reason I have been asked to produce this report is because SRUC perceived a problem that it thought some independent scrutiny might help it to resolve. But criticism is not personalised and I would never wish it to be so.
- 3.4 Assumptions:
 - a) Any developments in NE Fife need to avoid creating friction by adding value to the SRUC portfolio rather than moving those activities from elsewhere within SRUC or by creating greater internal competition for resources.

- b) As much as feasible, recommendations should simplify rather than complicate SRUC as a corporate entity with a clear mission.
- c) Developments need to complement activities at other institutions operating within the same sector at least in Scotland and possibly also more widely within the UK, i.e. as a minimum, they need to be additive at a Scotland level⁶.
- d) Global geopolitical, economic and environmental trends matter and need to be accounted for in any analysis of SRUC's future.
- e) Resulting recommendations need to be robust for at least the next three decades to justify a return on investment.

3.5 Principles:

- (a) SRUC should not attempt to supply educational or research services in FE using public funds⁷ when they have the potential to be supplied from the wider market using private funds, and it should help to create the market-placed structures needed for delivery. A legitimate use of public funds would be to support the creation of private markets (e.g. for education) which are then self-sustaining.
- (b) SRUC needs to ensure that its future as an organisation operating in the public interest is as independent from government as it is possible to be⁸. It still needs to access and use public funding, but it needs to be clear-eyed and explicit about why public funds are being accessed, what they are being used for and where the value lies for both SRUC and the public. There should never be any sense that public funding from government is being used as a crutch for SRUC to sustain its own interests – they should be demonstrably used to support public interest.

3.6 Audiences:

This report is structured for a diverse audience. The main audience is the Board of SRUC itself but many different stakeholders will be interested in what I advise. The report is, therefore, a hybrid document. Many things within it will be well known and obvious to some groups but will not be common knowledge to others. I delve into a lot of detail, especially concerning the strategic rationale for what is being proposed, because it is the feature of the range of factors affecting institutions like SRUC which is often overlooked in favour of local or short-term problems and solutions.

3.7 Disclaimer:

⁶ A caveat to this is the concern that there is no Scotland-wide strategic picture resulting in some other FE/HE institutions creating competition with SRUC, thus potentially rendering all efforts to deliver education unviable. Examples exist in golf management and forestry. Scotland is too small a student market to sustain multiple centres in some subjects. Lack of this strategic picture, and incentivisation from the SFC to comply, will mean continued low levels of performance among Scottish FE and HE institutions and low international competitiveness.

⁷ The definition of 'public' and 'private' here is that used in economics, i.e. 'private' is funding sourced from non-governmental entities such as individuals, corporations, or private institutions and is often used to generate private benefit; 'public' is sourced from state-controlled, or taxpayer-funded sources which are notionally assigned to generate 'public' or collective benefit.

⁸ This statement probably needs some additional explanation. I have been very surprised indeed by just how much staff within SRUC and some other stakeholders see SRUC as a quasi-arm of government, equivalent perhaps to some sort of arm's-length public body. The report expands on the legal status of SRUC, but I suggest there is a deep-seated culture in SRUC itself, within government, Parliament and in the minds of some within the public that SRUC is beholden to government. This is only true to the extent that it is in receipt of public funding but it is in fact a wholly independent charity. Its incapacity to assert itself as a self-determining institution is one of its biggest weaknesses.

At the end of this document, I set out my declaration of interests. While nobody is truly independent, I have very few interests which might affect my advice. However, I am only a single voice and there is absolutely no obligation on SRUC to act on any advice I give. I am not all-seeing into SRUC's business, or those of others involved, and there are very likely to be some misunderstandings reflected within this report. I have only had a very short time to produce this report – around 6 weeks while also fulfilling all my normal other commitments. Following the production of this report I will recuse myself from any further discussion of the matters in this document except, if requested, to provide clarification of things I have said.

3.8 Consultation:

I have read and consulted widely as part of the evidence-gathering process for this inquiry. I thank SRUC for making many documents available to me. I also thank those who gave their time to speak to me or to send me comments. However, despite multiple efforts to engage some parties, brokered by SRUC and (I believe) by others, some important parties did not respond. This includes Fife College, Dundee and Angus College, and NFUS.

3.9 Objective:

My objective for this report is to do nothing more than to open minds. During my exploration of the topic, I have had the pleasure of meeting a lot of people and many have different views about how to build a positive future for SRUC's contribution to NE Fife. Some even say SRUC should abandon its interests there. Their varied views are honest but they mostly represent narrow perspectives. Many come at the problem using different ethical frameworks⁹ and this creates misunderstandings when, in the end, everybody is really just trying to do what they think is best. Of course, in the end, decisions have to be made, and not everybody will agree with them, but I hope that when those decisions are made there will be enough common ground and mutual respect for everybody to get behind them. I see it as my task to try to create as much of this common ground as I can.

Background

- 3.10 SRUC is one of Scotland's newest higher education (HE) institutions even if it is composed of many disparate components, some with long histories in research, industry support and further and higher education. It hosts some researchers who are at the forefront of their field and this, together with the relevance of its research and teaching to urgent issues in land management, has been recognised by the award of the Queen Elizabeth Prizes for Education (formerly The Queen's Anniversary Prize) on three occasions (2017, 2023 and

⁹ These ethical frameworks make a big difference to how people process solutions to problems. For example, many professionals who are trained in science, economics or accountancy or who work within government or institutional governance will have been trained to take a strongly *utilitarian* view of problem solving. This promotes the maximization of positive net gain. Others just want to do the right thing, in the mould of *Kantian ethics*. Often, this is based on principles like, we should be looking to support young people and the disadvantaged, or support should be given to local businesses. These kinds of views are often held strongly by those people who come from the community. Others who hold to *contractualist ethics* want to find a solution which no one can reasonably reject. Many of these people like to get agreement through a deliberative processes. I often count myself in this category. Others follow elements of *virtue ethics* which emphasise a search for fairness and justice with a lot of humility and caution thrown in. A significant challenge with people who favour virtue ethics is that they will often see silence, in the face of disagreement, as a virtue and their voice might, therefore, not be heard at all! None of these positions is wrong, but the final solution probably needs to acknowledge all of them within a pluralistic, inclusive process of decision-making.

2025). It is, therefore, a recognised leader in agricultural education and research. For example, the 2025 award was for its work on the Scottish Farm Business Survey.

- 3.11 SRUC has a currently stated mission (see footnote #17) which aims to deliver an essential component of Scotland's national research and educational infrastructure. In this respect, it is recognised as one of the SEFARI¹⁰ institutions. The land-based industries in Scotland are an essential part of the national economy. They are also essential to social cohesion in rural communities. Key stakeholders state clearly that there is a need for a strong educational offering in skills to support land-based industries (Anon, 2026).
- 3.12 Despite this need, a major consideration within this report is how to deal with the stresses created by ongoing financial pressures and the need to continue a long-term process of re-shaping the research and educational provision to support land-based industries so that they are fit for the future rather than the past and present. This re-shaping began many decades ago with the amalgamation of regional colleges of agriculture to form the Scottish College of Agriculture which was then amalgamated with several regional colleges, including Elmwood, in 2012 to form SRUC. We need to view the current debates about SRUC, and its role in NE Fife, as part of this long-term evolutionary process.
- 3.13 Even if this report is focussed on Elmwood and NE Fife, it necessarily considers these elements within a much wider context concerning the future shape of the economy of land use within Scotland overall. In general, Scotland is at the mercy of much larger forces (e.g. markets, climate and geopolitical) which it does not, and cannot, control. Like all of Scotland's HE institutions, SRUC has a responsibility to work to mitigate these effects, even if those HE institutions rarely acknowledge this important role. For any development in NE Fife to be successful, therefore, it needs to be seen as part of a wider strategy for SRUC (SRUC, 2026) and a realistic assessment of future opportunities and challenges.
- 3.14 I want to focus this report on positives rather than negatives although sometimes this has been a difficult objective to fulfil. There is much to celebrate about the opportunities for land-based industries in Scotland, for SRUC as a major institution supporting those industries and for the community of NE Fife to benefit from those opportunities. Nevertheless, one reason for this report being commissioned is that there is a perception of a problem which needs to be solved. I need to spend time within this report reflecting on why these problems have arisen because the root causes need to be fixed.
- 3.15 This report has some resemblance to a strategic business case. It attempts to respond to the questions: *why* should SRUC develop its interests in NE Fife; *what* could such a development look like; and *how* could SRUC act to implement its vision? It uses foresighting methods to present the strategic picture which SRUC needs to consider when making investments so that these investments have traction *in future*. The future will not look like the past so there is a need to envision the shape of things to come. Since that future is likely to be very dynamic, flexibility to changing circumstances is going to be key to success. The method tries to isolate important current trends and then attempts to synthesise what they mean for the future. The report then examines the main options for different business models to operate mainly within NE Fife although these really apply to

¹⁰ SEFARI (Scottish Environment, Food and Agriculture Research Institutes) institutes which participate as a research partner eligible for Scottish Government funding for food, environmental and rural research.

SRUC as a whole. Finally, it makes some suggestions about the kind of activities which could be undertaken by SRUC in NE Fife and assesses their relative merits¹¹.

- 3.16 The report also necessarily considers the state of Scottish further and higher education (FE and HE) both of which are experiencing challenging times (SFC, 2025). SRUC is a part of this picture and the recent history of Elmwood is symptomatic of these challenges. It needs to be recognised that SRUC has been forced to make some difficult choices (e.g. about where, what and how to invest) and these decisions have sometimes been unpopular.
- 3.17 There is sometimes no good way of communicating bad news to those people who are affected but, as I shall suggest in this report, there are probably better ways of working with those affected in order to mitigate bad outcomes. I am also not convinced that the pathway chosen by SRUC has necessarily been built around a clear, unambiguous strategy which has been communicated with clarity. This has created both internal and external problems associated with carrying people with the undoubted enormous changes which are needed within the institution.
- 3.18 My hope is that this report will point to a way forward which all those involved can debate and modify together. To date, there are a lot of people who feel things *have been done to them rather than done with them*. This includes the community in NE Fife, the staff at SRUC Elmwood and, for the reasons stated above, SRUC itself. Most people involved have been trying to act in good faith but sometimes they are communicating in the wrong ways and at cross-purposes.
- 3.19 Some of my conclusions and recommendations will make difficult reading for certain groups. Some are made to highlight past systemic weaknesses and to, hopefully, help certain groups to be more self-reflective about the harms which can accrue from their actions. Others suggest ways of working in future which might jar with people who are traditionalists, but I hope they will approach my suggestions with an open mind and inquisitiveness.

4. Historical perspective and the current situation

A brief history of Elmwood

- 4.1 The original Elmwood College was established in 1972 as Scotland's first regional technical training centre for land-based studies. These included agriculture, horticulture, game-keeping, golf course management and other technical courses in land-based management. The College itself developed out of the growth of local courses in land-based subjects which had their roots in horticultural and agricultural training provided by Bell-Baxter School from the 1940s.
- 4.2 Elmwood developed additional courses in support of the local community, including healthcare, early years education training, catering and other technical vocational subjects. By the 1990s, it had evolved into a local training hub supporting the community of north-east Fife while still retaining its specialization in land-based educational provision which

¹¹ While doing this, I have tried to avoid providing, or using, estimates of economic value of activities. Much more work would be needed if these were to be pinned down to any level of accuracy.

had national outreach. Its provision of courses in golf course management also attracted some international students.

- 4.3 By the early 2000s Elmwood had evolved into a community-based further-education college and it was graded as one of the best in the country. However, its relatively small size made it relatively expensive to operate and this resulted in a long-term process of budget erosion as it was forced to align with national-level principles which determined the distribution of government funds. This eventually led to loss of independence through amalgamation.
- 4.4 When SRUC took over Elmwood in 2012, the vocational training it provided in non-land-based subjects sat awkwardly with SRUC and was split out and placed in the newly-formed Fife College. The student places paid for by the Scottish Funding Council (SFC) and associated with these subjects also moved to Fife College. It was the decision of Fife College to then withdraw its educational provision from the NE Fife region and move it to its sites at Kirkaldy, Glenrothes, Dunfermline and Levenmouth.

The creation of SRUC

- 4.5 The merging Oatridge, Barony and Elmwood Colleges (all FE institutions) with the Scottish Agricultural College (an HE institution) in 2012 was largely forced on the colleges by the SFC's plan to regionalise the college structure within Scotland. Setting aside the rationale for this regionalisation, it was likely to leave the provision of vocational training for land-based industries in the hands of generalist colleges. At the time, it was considered that this would not be in the best interests of those industries.
- 4.6 The merger document¹² which appears to be the only business case for the creation of SRUC, said "the financial forecasts clearly demonstrate that unless significant changes are made to its structure and income/cost base, the merged organisation is not financially sustainable in the longer term" (p46). It also suggested that the new institution would need an injection of £12 m in Year 1 to make the transition (p47). Records suggest that actual investment from the SFC, which must have approved the merger, was less than one-tenth of that amount. I also understand that funds which had originally been allocated to rebuild the Elmwood Campus before the merger in 2012 were sent elsewhere after the merger.
- 4.7 Like a large proportion of buildings within the Scottish further education infrastructure (SFC, 2025)¹³, there is a significant maintenance backlog at SRUC amounting to about £70 million (Powell, 2025). The main building at Elmwood has been closed and the campus footprint has been downsized. There has also been strong community and political concern about the potential loss of key programmes like animal care, which historically accounted for about one-third of students at Elmwood (see Appendix 3).
- 4.8 When SRUC took over the Elmwood campus in 2013, an independent survey assessed that "much of the main campus [at Elmwood] is in a poor condition and the main teaching, learning resource centre (LRC) and administrative building is considered by the college and its advisers to require replacement or major refurbishment" (p53). In addition, it said

¹² Barony College, Elmwood College, Oatridge College and the Scottish Agricultural College Merger Proposal Document (MPD), Thursday 3 May 2012.

¹³ The poor state of university infrastructure was also highlighted at a UK level in a recent report from the National Audit Office. <https://www.nao.org.uk/press-releases/uk-research-infrastructure-better-reflects-national-priorities-but-university-maintenance-lags/>

“a significant proportion of the three FE land-based college accommodation is assessed to be in poor condition. Some 22% was described as “inoperable” which compared to the sector average at 3% (p53). It concluded that “it is envisaged that the SFC will support the estates strategy with sufficient levels of capital to the merged organisation” (p55). As I shall show, this support has never been forthcoming. Indeed, SRUC’s capital allocation from the SFC is more than an order of magnitude less than for other colleges with equivalent needs.

- 4.9 Some stakeholders think the old main building of Elmwood could be resorted for use by the community. It is outside my competence to provide a strong steer about what to do with this building but, even if part of the frontage is listed, I think it is unrealistic to restore it (see Appendix 8). I do have experience operating trusts dedicated to restoring old buildings to new and modern functions and restoration is always more costly than building a modern replacement. Restored buildings are also more expensive to operate than new buildings. The question about the future of buildings could become a distraction from the main issues concerning how to fund student FE places in NE Fife in future.
- 4.10 In financial terms, the greatest positive statement in the business case for the creation of SRUC was that “the partners believe that there may be some opportunities for achieving economies of scale” (p47), but these were never specifically defined and it appears that few ever emerged and many of the costs associated with merger – such as those associated with consolidation of T&Cs for staff, are still outstanding. In addition, the business case did not even present the counterfactual which would have involved leaving the FE content of land-based studies within the regional college structure. It focussed solely on the benefits but never presented the risks. It failed to state clearly why the land-based industries needed special treatment compared with other industries.
- 4.11 Many of the problems SRUC is facing in the present, including those at Elmwood, can be pinned back on this decision and how the merger was implemented in 2012. As I shall explain later, this has been compounded by the way the SFC has chosen to continue to classify SRUC which places it at a significant disadvantage relative to public sector bodies which perform similar roles on behalf of government.

The place of Elmwood in the current educational architecture of SRUC

- 4.11 As a result of the merger into SRUC, much of the education in land-based subjects and some research became coordinated across Scotland. SRUC is now structured internally as two Schools each of which has a presence at several campuses. Elmwood is now one of five different campuses occupied by SRUC, although SRUC occupies other sites too (see table below). Each site has specialist education and research functions associated with its infrastructure.
- 4.12 Overall, SRUC occupies 347 separate buildings (110 of these are leased) and a significant proportion of these are over 50 years old. This includes 113,600 m² gross internal area and, in addition, SRUC has 4,200 hectares of land. There is a £71m backlog of liability on estate maintenance.

Table 1: The area of each of the campuses used by SRUC plus the main subjects covered at each campus.

Site	Main academic functions	Size (m ²)*
Kings Buildings	Head Office; soil and veterinary diagnostics	10,586
Oatridge	Equine studies, engineering, veterinary nursing, agriculture	26,656
Barony	Livestock agriculture, animal care and forestry	17,691
Craibstone	Veterinary studies	13,789
Elmwood	Horticulture, golf course and estate management	13,235

*There is a further 31,667 m² at the Rural and Veterinary Innovation Centre (RAVIC), Auchincruive and Bush

- 4.13 The list of courses offered by SRUC is impressive considering how small the institution is. This includes four major categories: (1) degree-level programmes in subjects such as Animal Nutrition, Equine Science and Management, Agriculture, Environmental Management and Veterinary Science.; (2) Training and Short-term courses in subjects such as “lambing”, “chainsaw” or “pesticide application”; (3) full and part-time FE and HE and Modern Apprenticeships in subjects such as “agriculture”, “animal welfare”, “engineering”, “golf course management”, “wildlife conservation”, “veterinary science” or “rural business management”; and (4) Secondary School Programmes in subjects such as introductions to gardening or horticulture. Enrolments at each campus are presented in Table 2.

Table 2: Enrolments and FTEs for FE and HE at each of SRUC’s campuses

2024/25				
Campus	FE		HE	
	Enrolments	FTE	Enrolments	FTE
Aberdeen	252	173.78	498	419.52
Barony	748	595.67	340	289.13
Edinburgh (Kings Buildings)	0		413	368.91
Elmwood	383	207.52	298	186.69
Oatridge	1763	1181.36	270	240
Total of above	3146	2158.33	1819	1504.25
All sites	3,204	2191.33	1979	1603.55

- 4.14 Some of these courses are offered from Elmwood which had 394 FTEs in 2024/25 representing about 10% of the student cohort of SRUC as a whole. Appendices 4, 5 and 6 provide information about the current students being taught at Elmwood, but the present course structure at Elmwood is as follows:

The general focus is on

- Horticulture and Future Food Systems
- Business and Social Sciences (including Economics)
- Natural Capital (encompassing Conservation, Environmental Sciences and Forestry).

Specifically, there are tertiary courses in the areas of

- Golf Course Management
- Food and Drink

- Horticulture
- Gamekeeping
- Wildlife and Conservation Management
- Ecological Surveying
- Countryside Management

Further Education in NE Fife

- 4.15 A March 2017 Scottish Parliament report highlighted that the division of the Elmwood campus in Cupar between Fife College and SRUC created an "inherently unstable" and "unsustainable" situation for Further Education provision in North East Fife (Anon, 2017).
- 4.16 The SFC commissioned a report on the subject in 2017 (Scothorne, 2017) which suggested there was a demand for about 750 people annually to replace those leaving the labour market. In view of the effective abandonment of Elmwood by the regional colleges, it concluded that “demand for FE in the north of NE Fife is therefore being pulled two ways – north to Dundee and Angus College (and to a lesser extent Perth), and south to the new facilities that have been or are being developed by Fife College”, and that “in the light of these changes it will be neither realistic nor desirable to attempt to reverse these trends, but there does appear to be the potential to create an enhanced provision of FE in the north of NE Fife.” It also concluded “our research suggests that the only feasible location for additional FE provision is at Cupar.” The ‘developments’ by Fife College, referred to above, include its Levenmouth Campus which is about 15 miles from Cupar (25-30 minutes by road).
- 4.17 As far as I am aware, nothing ever materialised from these conclusions, but considering the importance of local FE provision to the economic development of communities, it would seem sensible for SRUC to renew discussions with Fife College about what options exist to re-build a cooperative development on the Elmwood site to deliver local FE. This could be built around a community-based hub within the current Elmwood site. In section 7, I suggest an operating structure for such a collaboration. It would be important that students have a seamless experience even if different elements of FE provision come from different parts of the FE system.

Commercial activity and capital value

- 4.18 SRUC is highly unusual as a university because a significant proportion (about one-third) of its income comes from commercial activity. This comes in two main component businesses which lie within SRUC Innovations:
- a) It has a significant consulting arm, called SAC Consulting. This is the modern evolution of the agricultural advisory services once provided, largely free-of-charge, to Scottish farmers by the Scottish Agricultural College. In theory it is a vehicle for using expertise from across SRUC in a consultancy role but, in practice, there appears to be limited cross-fertilization between consulting and research/education. A significant part of the function of SAC Consulting is the continued delivery of Scotland’s Farm Advisory Service which is a contract awarded through a competitive tender process by the Scottish Government and which is completely separate from the educational elements of grant-in-aid to SRUC.
 - b) SRUC also operates SRUC Veterinary Services which provides laboratory analyses to support the veterinary industry. The SRUC Veterinary Services portfolio of work includes the Scottish Government’s grant funded VAS veterinary surveillance

programme. This is also completely separate from the educational elements of grant-in-aid to SRUC.

- 4.19 SAC Consulting has a presence in Cupar but does not use the Elmwood site. SRUC's proven track record with organising and delivering commercial activity could be a foundation for future innovations in both research and education (see Section 7). It is probably the most distinctive feature of SRUC's business model but I question whether SRUC maximises the benefit these businesses bring to its core purpose. There may be an opportunity in future to consider the optimal model to further develop these businesses to increase surplus returned to SRUC whilst retaining reputational benefits. I suggest that these businesses should be developed with commercially focussed thinking to optimise financial and reputational benefits. SRUC is going to have to secure alternative investment or raise capital in future and furthering work to maximise the performance of the subsidiary business is a potentially powerful asset to the SRUC group.
- 4.20 More generally, SRUC has other assets which may return a greater value to SRUC if they could be sold. Some of these assets have been gifted to SRUC and were once publicly owned so there may be a notional obligation on SRUC to ensure and proceeds from these assets are used to further wider public interest. In this case, I suggest that any sale of assets, possibly including those from Elmwood (should this happen), should be placed in an endowment which, as much as possible, is protected from supporting operating deficits at SRUC.

Economic opportunities in NE Fife

- 4.21 Many consultees pointed to the opportunities there are for SRUC in NE Fife. Those that are notable and influence SRUC include:
- a) Golf: NE Fife is a global centre for golf and it has a significant concentration of land use in the region focussed on recreation. SRUC inherited a golf course as part of Elmwood. I heard from both staff at SRUC and a representative of the St Andrews Links Trust how there was a continuing demand for practical skills in golf course management from entry level (e.g. greenkeeping) to business management level. Some of the courses offered by SRUC from Elmwood are over-subscribed and there appears to be more demand than can be met with the current level of investment.
 - b) Green- and blue-space services: This is an extension of golf and includes recreational use of both countryside and the shorelines along the NE Fife coast. There is a need to ensure that land managers are able to recover the costs of these activities and that they do not degrade the land and coastal regions. Proximity to the Angus Hills and Glens also plays into this aspect of what NE Fife offers to tourism. However, other services include the adaptation of farming practices to enhance carbon storage, water retention and reducing flood risk. This is a rapidly rising interest and there are estate managers in NE Fife who are already experimenting (without the support of any research organisation) with how best to manage land to optimise across farm productivity and the provision of these other services¹⁴. SRUC should be building partnerships with many of these innovative land managers.
 - c) Education: The University of St Andrews already brings significant numbers of people to the region and is building a sustainable campus at Guardbridge which is focussed on the development of green technologies. However, it is also a major user of resources within the region and has a programme of development to improve its environmental

¹⁴ See <https://www.eastneukestates.co.uk/>;

footprint. Like any other business, it needs skills and technologies to deliver its objectives.

- d) Hospitality: The hospitality sector is a significant beneficiary of golf and education in particular and the St Andrews area has a significant concentration of hotels and restaurants. Although SRUC may not be focussed on supporting the hospitality sector, this does not mean that it is unimportant in the consideration of why SRUC may wish to build a regional presence.
- e) Diversified agriculture (agricultural de-intensification): The region has some relatively large farm businesses which are exploring agricultural diversification and de-intensification. This is closely linked with the provision of value-added environmental services (see b above) and often involves the same businesses. This includes the local sale of produce by linking farming businesses to the attraction of the region for tourism, and building farming solutions which exploit innovative, lower-intensity methods including, for example, mob grazing and minimal ploughing. The latest innovation has been the development of flax growing in the Bow of Fife led by East of Scotland Growers.
- f) Horticulture and soft fruit (agricultural intensification): The region has a fascinating divergence of land use between de-intensification and intensification of food production for direct human consumption. As a result, I suspect that NE Fife has one of the most systemically efficient agricultural systems in Europe which, if rolled out more widely, could dramatically improve food security. It has climate and soils which support soft fruit and horticulture, including the growing of potatoes, for direct human consumption. It also supplies a large proportion of the oats used for human consumption (e.g. as porridge or in baked products). A significant amount of Scotland's fresh farm produce comes from NE Fife. A consortium of farmers has formed East Coast Growers which is designed to shorten supply chains to deliver fresh produce to supermarkets and which returns more of the proceeds of sales to the growers. Horticulture and soft fruit are currently the only sector of Scottish agriculture which is expanding and which are economically viable without government subsidy.

4.22 There is, therefore, a rich picture of the opportunities for SRUC in NE Fife. Expansion of aspects of this picture into a suggested set of investment propositions is made in Section 8 of this document.

SRUC's strategy

4.23 When created, SRUC had ambitions to grow into a fully-fledged university. This is a process which is still in development but it passed a major milestone in 2024 when SRUC received its own degree awarding powers in 2024. It is still awaiting the award of 'university title'.

4.24 SRUC's mission is stated in its recently published strategy¹⁵. Within the context of discussions with senior management and during a recent Parliamentary evidence session

¹⁵ A summary of the main elements of the mission is to:

- (a) Redefine what tertiary education means in the 21st Century.
- (b) Create a high-performing innovation and skills ecosystem that powers a natural capital-based economy.
- (c) Address major global challenges of climate change; food, water and energy security; and biodiversity loss.
- (d) Drive imaginative new ways of working between business, government and academia.

(Anon, 2026), the mission has been portrayed differently, namely that SRUC should differentiate itself by creating an end-to-end tertiary education pathway which can allow all students to progress to their own level within a single institutional education structure. And this should be “place-based”. I want to deal with both these objectives separately.

- 4.25 *End-to-end tertiary pathway.* This expresses an ambition for SRUC to provide educational services from entry-level vocational FE all the way to PhD. It has much to commend it in terms of the promotion of social mobility and attainment of personal potential but it is a challenging model to deliver because:
- a) The FE and HE functions need different teaching methods, skills and infrastructure.
 - b) Sustaining credible research is an important enabler for HE capability and should also be an important part of sustaining high standards in the consultancy arm of SRUC. The institution has to play in an increasingly competitive international market and any dilution of research-led teaching caused by focussing resources on FE will set SRUC at a disadvantage.
 - c) The FE and HE educational offers cater for fundamentally different markets: while FE is mainly concerned with tactical delivery used for *current* industry needs, e.g. by providing skilled workers, the HE educational offer needs to produce those practitioners who will shape *future* industries.
 - d) The SFC funding formulas deal with FE and HE very differently and are not designed to cope with institutions which cover both FE and HE provision.
 - e) Such a diverse educational framework will be expensive to deliver and it is questionable whether it is feasible to do this in an institution the size of SRUC.

The issues create unsurfaced dilemmas for SRUC. As a result, SRUC has had to make choices and it has favoured investment in HE over FE. This favouritism is denied by SRUC management but the evidence is strongly contrary¹⁶ to their view.

- 4.26 *Place-based education.* I have struggled to understand what this means since, by definition, all education is place-based in some way. I have encountered others who also struggle with the concept and even SRUC’s own staff and the SRUC Board appear to be confused¹⁷. For example, ‘place-based’ to a secondary school leaver moving into FE probably means a place where they can receive education which is local but sufficiently away from home to provide them with a social life. This is very different from ‘place-based’ in the mould of a work-based apprenticeship. It is a hard sell to convince me that SRUC is in any way structured to cater for both these interpretations of ‘place-based’, let alone several others which exist. It clearly fails on the former definition in NE Fife. As I suggest later, the issue of ‘place’ probably ought to be eliminated from future discussions about how tertiary education is delivered. Delivery wherever, whenever and however it is needed is going to be the way forward.

¹⁶ This includes the investment in the vet school which has used much of SRUC’s capital and also diverts student credits into this field, but Elmwood itself is evidence of lack of investment in FE. In its strategy, SRUC has expressed an ambition for it to be within the top 200 universities in the world but this is impossible if it does not place HE as its top priority.

¹⁷ For example, there was a suggestion in one Board document I saw that “SRUC strategically maintains a regional presence as a key part of our distinctive model”. It is one thing to be distinctive, but a reason for this distinctiveness could be that no other organisation can make such a model work either logistically or financially. I also question the idea that SRUC currently has a “regional” presence. There are significant parts of Scotland where there is no SRUC presence so the concept is misleading. In addition, “presence” needs to be functional, which is much more than being representational.

- 4.27 Given the global and national relevance, distinctiveness and potential associated with some aspects of the economy of NE Fife (see Para 4.21), it is surprising to me, and to many of those I consulted, how little work SRUC has done to develop a business case to exploit these opportunities. The opportunities around golf seem obvious and I have not seen any rationale as to why SRUC has not invested in this (beyond the creation of an online degree course) and/or in horticulture.
- 4.28 At the same time, SRUC has chosen to invest a significant amount of its capital and operational effort in a new vet school based mainly from Aberdeen. I have encountered many people who find this decision hard to understand. SRUC needs to communicate the benefits of this investment better than it does at present. SRUC undertook stakeholder consultation and sector analysis before make the decision to invest in this facility. However, the opportunity costs associated with this development are large and these would need to be offset by a proportionately large benefit. It is this level of benefit that I think those I encountered find hard to see. This has undoubtedly had a direct bearing on SRUC's ability to make investments elsewhere, including in NE Fife.
- 4.29 Rather than being defensive about past decisions, SRUC needs to pick a new strategic path and invest in it with purpose. At the very least the palimpsest of the landscape of NE Fife with its local agricultural diversity presents a strong potential foundation for education and research at all levels. In the mould of 'think big, act big' the vision should really be to create a modern, fit-for-purpose agricultural education and research establishment with deep roots into the surrounding land-based businesses in the region.

Financial stresses

- 4.30 Like most Scottish Universities, SRUC is not in a strong overall financial position. The fundamental assumptions underlying the Scottish HE system – involving the use of overseas student income to support critical mass – have changed in the last few years and the system are unlikely to revert any time soon. This will need to drive greater rationalisation across the sector and SRUC needs to build its future around this kind of rationalisation, most probably by building closer working relations with other suppliers across the sector.
- 4.31 In it's annual accounts (year to 31 July 2025), SRUC reported an overall operating loss of about 11% of total income and this reflects a similar situation to that of many other Scottish universities and colleges. The total reserves of SRUC have declined partly because of investments made and partly to cover deficits. SRUC has implemented a "Financial Recovery Plan" which mainly addresses the problem by cutting costs, a short-term solution to deal with a systemic problem. SRUC's challenges are not just restricted to its estate but also include legacy business systems. These mean it struggles to have all the information it needs to manage the business.
- 4.32 The revenues which SRUC receives from the Scottish government for teaching Scottish HE amount to about £17.8 million (Table 3) and a further £9.7 million of revenue comes from Scottish Government grant for FE. This means that FE is worth about half as much to SRUC and HE. The total income across FE and HE is, therefore, £27.5 million which is almost one-third of overall revenues for SRUC. In future this is unlikely to increase in real terms and it is quite likely to decline.

Table 3: SRUC's income from the Scottish Funding Council for HE provision	Total for AY 2024-25	Total for AY 2025-26	Small specialist institution grant AY 2025-26	Disabled student premium for AY 2025-26
Funded student places (FTEs)	1,518	1,456		
Total teaching grant (£)	11,885,768	12,129,350	1,096,453	54,000
Research and Innovation grant (£)	5,199,000	5,593,097	*	
Capital grant (£)	78,855	79,134		
Total (£)	17,165,141	17,803,037		

AY = Academic Year

-Source: <https://www.sfc.ac.uk/publications/university-final-funding-allocations-2025-26/>

* Made up from:

Research excellence grant 3,515,097

Postgraduate grant 81,000

Knowledge exchange and innovation grant 1,997,000

Why does SRUC struggle to maintain Elmwood?

- 4.33 By ceding Elmwood to SRUC in 2012, Fife College probably transferred a relatively high proportion of its liabilities to SRUC. One estimate suggests that SRUC has around 10% of the backlog of college maintenance in Scotland but are supplied by the SFC with 1% of the funding. SRUC has a greater internal area per student than other colleges even accounting for its size (Figure 1a). When the capital allocation is included in the cost function for FE colleges it can be seen clearly that SRUC is a significant outlier. It is significantly underfunding for the maintenance of its infrastructure (Figure 1b). Setting aside the choices SRUC itself has made (see para 4.28 above), this is the fundamental reason why the main building at Elmwood is dilapidated. SRUC has a very large estate for the size of its student body and it does not have the capital to sustain, let alone maintain, this estate.

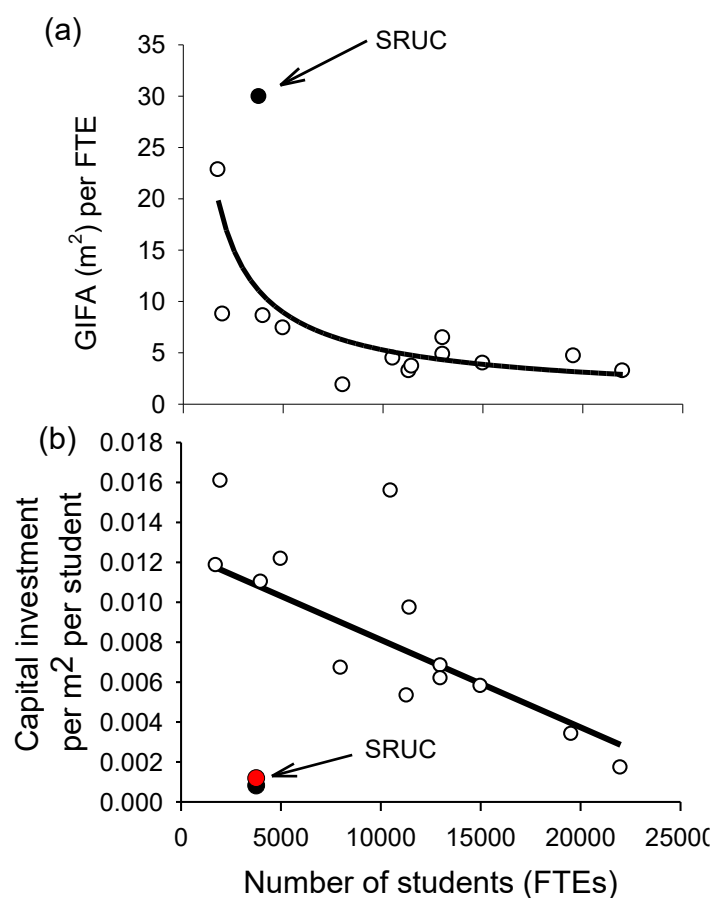


Figure 1. Scatterplots showing the relationship (a) the Gross Internal Floor Area (GIFA) per student FTE (Full-time equivalent) of a majority of Scotland's FE colleges and the size of the college represented by the total student FTEs; and (b) the capital investment made by the Scottish Funding Council in each student FTE per square metres of space. There was no single source of data and most were scarsed from the web. Some colleges are absents because there was no appropriate document providing information about either FTEs or the size of the college estate. There will be some inaccuracies within the data but these are unlikely to be of a magnitude to affect the relationship illustrated. Capital funding is the sum of funding granted by the SFC from 2024-2026. In (b), two data points are shown for SRUC: black is the capital investment based on the FE portion of the SRUC allocation; red is total capital investment in SRUC based on both the FE and HE potion of the investment.

- 4.34 SRUC has, therefore, inherited a large estate in a poor state of maintenance and Elmwood serves as a clear example of this. But the funding SRUC receives is considerably below what SRUC needs to maintain, let alone restore, its estate.
- 4.35 There is evidence that the SFC does not have a full grasp of the SRUC's dilemmas. The SFC was kind enough to respond to my request for input to this report. It confirmed that it treated SRUC as an HE institution (which explains the low capital support budget) but then proceeded to list the outcome expectations for FE institutions as if these applied to SRUC. Even in view of the explanation of how funding works in Appendix 7, I am puzzled by the apparent contradictions in the way in which the SFC seems to view SRUC: it classifies SRUC as an HE institution but expects it to deliver FE outcomes without paying the costs of this service.

- 4.36 If SRUC is maintained in an untransformed configuration (i.e. retaining the legacy structures associated with the component colleges used to form SRUC), it would take a 10-15 times increase in the capital grant from the SFC to bring SRUC into line with other similar institutions in Scotland. However, given the mounting legacy of underfunding and the recent estimated £70 million backlog in maintenance (Powell, 2025), it appears to me that the multiplier would have to be much larger for a number of years in order to offset that rising legacy of disrepair
- 4.37 One remarkable feature of this picture of financial stress is why SRUC did not decide to close Elmwood (plus several other of its campuses) a long time ago. I am aware that some people within SRUC, who saw this through the narrow lens of institutional financial stability, would have closed Elmwood. Others saw closure as politically or socially difficult and, perhaps, even appreciated its potential. However, the result of these polar opposite views has been an unhealthy middle ground involving long-term disinterest. If SRUC does only one thing in response to the report, it is that it should be clear about its intentions and back them up with positive actions.

Stranded assets and disadvantaged people

- 4.38 Elmwood is now a deteriorating asset. The community in NE Fife had benefitted in the past from a first class educational services when Elmwood College was fully operational. I experienced a tremendous level of concern within the NE Fife community about the effective loss of Elmwood as a college.
- 4.39 There is unfairness in what has happened to Elmwood and several institutions need to accept their contribution if there is to be any hope of redress. The way in which public institutions fail to cooperate effectively has a high probability of being self-destructive¹⁸. This reflects a common structural problem among public institutions which can be summarised as ‘institution first, the people second’ (Hyde, 2026).
- 4.40 The institutions responsible are:
- a) The Scottish Funding Council (SFC), which agreed to the creation of SRUC in a form which, by the calculus of the times, was unsustainable. It has then proceeded to support SRUC in a way which can best be summarised as lacking any sense of strategic vision. At worst, it is driving SRUC into the ground.
 - b) Fife College, which has *de facto* responsibility for the provision of further education (FE) services in NE Fife but which has not backed up that responsibility with clear actions. NE Fife is the largest and possibly most populous of the seven sub-regions of Fife so it seems odd that it does not support a presence in the region. It not only withdrew its educational offering from the region following SRUC’s take-over of Elmwood in Cupar, but at the time it stripped out the funding capabilities for FE

¹⁸ As an example of this, I point to the efforts made by *both* SRUC and the University of the Highlands and Islands to *both* create FE facilities in Forestry. Other FE Colleges are also beginning to teach land-based studies in competition, rather than collaboration, with SRUC. SRUC’s establishment of a vet School looks like a similar kind of siloed thinking brought on by the incapacity of educational institutions to work in collaboration. When implemented without systemisation many of these kinds of initiatives serve Scotland badly because they then have the potential to reduce the viability of all concerns.

students and it has never returned. Fife College chose not to respond to my consultation despite multiple requests for input.

- c) SRUC, which has shown institutional disinterest¹⁹ in the problem of further education (FE) in NE Fife while it uses its limited resources to pursue other goals of questionable strategic merit and achievability.
- d) Fife Council, which has stood by and done very little while Elmwood College has deteriorated.

4.41 Ultimately, the SFC needs to carry much of the responsibility for this failure. SRUC itself has been a proxy which has been flogged in response and Fife College has been content to deflect criticism onto SRUC which should have been focussed on it. That Fife Council has also been willing to stand by and let this happen has almost certainly been to its detriment as well because it will eventually have to pay the costs of unrealised economic potential and poor social outcomes.

4.42 Overall, this is a classic case of multiple public bodies acting in their own interests by shifting risks and responsibilities around between them and ending up placing the costs on the very people they exist to support. I think it is this point which infuriates those people within the community who speak out, and they are right. Each of these institutions – SFC, Fife College, SRUC and Fife Council – need to humbly acknowledge their mistakes and work together, in genuine partnership, to resolve the situation²⁰.

Clarity of legal status

4.43 However, SRUC is different from SFC, Fife College and Fife Council because it is *not* a public body. Some of SRUC's problems which have led to the decline of Elmwood stem from lack of clarity of SRUC's legal status and I recommend this needs to be corrected.

4.44 SRUC needs to clearly assert its legal status as an independent, non-government institution and the different obligations (or lack thereof) which flow from this. There is a lot of ambiguity in the ways in which SRUC's purpose is perceived and projected. This is echoed in expectations placed on SRUC by some stakeholders, local government, the government and some people within SRUC itself. Many seem to see SRUC is a social or public enterprise. SRUC may have some level of public duty but confusion exists about the level of independence of SRUC from the public sector²¹.

4.45 SRUC can choose to operate as if it is a public sector body if it wishes, but it will probably have to accept very different governance controls although I would never recommend that

¹⁹ There has been a debate within SRUC about whether to close Elmwood altogether. Those who see it as important that SRUC retains some responsibility for Elmwood have held sway, but this has not prevented those who hold sway over operational spending, and who disagree with the strategic decision, from creating the circumstances in which its long-term viability is undermined. There has been a shortage of collective governance responsibility to get behind the decision to keep Elmwood open and to develop a sensible rationale for its future.

²⁰ Game theory shows that the collective payoff is always greater when different parties collaborate rather than default to pursue their own interests. This is known as the prisoners' dilemma.

²¹ To be clear, Scotland's Rural College (SRUC) is a private company limited by guarantee, registered in Scotland (Company Number: SC103046). It operates with charitable status (Scottish Charity Number: SC003712, see Appendix 2 for SRUC's charitable objectives). In contrast, as an example of a further education college, Fife College is a registered Scottish further education institution established under the Further and Higher Education (Scotland) Act 1992. It operates as a body corporate, functioning as a public body funded primarily by the Scottish Funding Council to provide education and training services.

it moves in that direction. Moreover, if SRUC persists in suggesting that SRUC has a broadly defined and nebulous public duty then others will expect them to deliver on this when they are unfunded for this function. Much of what has happened at Elmwood has arisen because of this misunderstanding.

- 4.46 Therefore, expectations have been placed on SRUC which cannot be delivered but it is partly SRUC's responsibility for allowing this to happen. For example, I was surprised not to find a clear contract between the SFC (a public body) and SRUC (a non-public body) for the FE and HE services SRUC provides in return for public funding. This lack of clarity in contractual obligations in both directions is why SRUC finds itself subject to the whims of an underfunded, politically pressured public sector body (SFC), which likely has little corporate memory, which is institutionally designed to shift risk onto bodies like SRUC, and which is very unlikely ever to present a strategically consistent position for SRUC to build on. SRUC needs to re-set its relationship with the SFC to ensure it is contractually normalised.

Valuing colleagues

- 4.47 The delivery of land-based courses at Elmwood has remained at a roughly stable level over the past few years but I have heard from staff that there is more demand than supply. More could be done to build business cases to solve this supply-side issue. SRUC has initiated a new degree course in sustainable golf course management which will help sustain or boost numbers, although most of this is taught online.
- 4.48 SRUC has many skilled and dedicated staff who are loyal to the organisation and its purpose. I enjoyed meeting many of them when I visited Elmwood. Many have ideas about how to develop SRUC and a key to success in future is going to be unlocking the latent creativity within these colleagues. A lot of enthusiasm and ideas emerged during the discussions I had with them and in subsequent correspondence.
- 4.49 However, at Elmwood, the staff are currently leaderless and rather rudderless and this needs to change quickly. There is no culture of upwards management or of listening downwards through the system, let alone clear communication of the purpose and objectives of the institution. There are many reasons for this, but the distributed structure of SRUC mixed with the new school structure which cuts across these physical and geographical structures (together with associated loyalties) presents a complex picture of lines of management and accountability and many staff will struggle to understand what is expected of them. As a result, I suspect there is a lot of productivity inefficiency embedded within SRUC.
- 4.50 In my view, SRUC should have a "site leader" or "director" who should be present at Elmwood and who can be a focus for communication with other parts of the SRUC system and should be tasked to develop the SRUC capabilities in NE Fife. It is the necessity for this kind of role which adds costs to the distributed operational model of SRUC, but SRUC cuts these back at its peril.

5. Strategic context

- 5.1 Having set the scene with respect to SRUC in the foregoing sections, I now want to set the scene with respect to the strategic position of land-based industries and the economy they support because this has a strong bearing on the recommendations about which path SRUC should follow if it chooses to invest in NE Fife.
- 5.2 By most measures, much is likely to happen over the next 30 years which could create significant headwinds for any investment in NE Fife unless this investment is designed to flex to future trends to create opportunity. We can be reasonably certain that assumptions which have applied in the past will not be relevant in the future.

Foresighting the challenges ahead: training and education

- 5.3 Delivery of educational courses will always be important. What may be taught in 30 years time and how teaching is conducted is likely to change but the necessity for training within the community will always be there and the need, if anything, is likely to increase.
- 5.4 Careers are much more dynamic than they once were and there is an emphasis on people who can multi-task and who hold a range of skills. The educational experience is shifting to become more of a lifetime journey than it has been in the past. The advances in technology and shifting societal norms are speeding up the rate of change which means that there is an every-present need for continuing professional development. As the population ages it will need to draw on the capacity of elderly people to continue to contribute constructively to society (Kenny et al., 2008) and there is increasing evidence that this also helps to reduce deterioration in old age (Cegolon and Jenkins, 2022, Ammous et al., 2025). People can make different contributions at different stages of their lives and it is, therefore, important to provide those opportunities (GoScience, 2013).
- 5.5 Nevertheless, during my discussions about Elmwood with representatives of the community it has been emphasised to me how important a community-centred college is as a pathway for young people to start constructing their own career journeys. I did not need to look far because many of those who were speaking up for Elmwood were former graduates and many have had very successful careers. This does not, of itself, prove the point that community-based FE is essential because the counterfactual could have been that these people might have been just as successful had they been educated elsewhere, but it is backed up by evidence from elsewhere (LGA, 2020, DBIS, 2013).
- 5.6 Perhaps the most compelling argument for the local delivery of FE is to ensure that the progression from secondary school education to tertiary education happens smoothly, especially for young people who have little idea what they wish to do, or who come from challenging circumstances, or who have special needs (SMC, 2022). There are well-rehearsed and well-evidenced economic arguments for the benefits of investing strongly in this transition to tertiary education and for delivering this in close proximity to where the recipients live.

Foresighting the challenges ahead: AI

- 5.7 Artificial Intelligence (AI) can be viewed from three perspectives when it comes to opportunities and challenges for SRUC in NE Fife. One of these is the educational challenge

associated with helping people to adapt to working differently in an AI-drive society; another involves the adoption of AI into the educational processes used by SRUC which could greatly reduce costs; and the other is the technological opportunity to make the land-based industries more efficient and effective. All these aspects will have a strong part to play in the future.

- 5.8 AI is likely to bring substantial changes to how people work, the kind of work they do and how it is valued. I find it hard to explain how much AI has revolutionised my own work but it illustrates to me that there will be a future divide within society between those who know how to make it work for them and those who struggle. When combined with other technological change, it will render many past assumptions and norms invalid. The meaning of labour and leisure will change and, with it, the role of people in society will also change sometimes for the better and sometimes for the worse. Injustice from the inevitable adoption of AI is impossible to prevent, but the earlier we identify challenges and adapt to them the greater the chance that negative outcomes can be reduced and positives maximised.
- 5.9 The workforce trends due to the adoption of AI which affect how educational institutions have to respond are as follows:
- a) ‘Jobs will change more than they disappear’:
In Scotland, AI is most likely to augment existing jobs rather than replace them, especially in sectors that dominate the economy. In agriculture and land-based industries this will lead to increased automation, precision farming, animal health monitoring, and bespoke design of production systems which are tailored to local soils and environmental needs. Completely different systems of food production are likely to emerge (see later proposal). More efficient, less labour-intensive business systems will reduce business inefficiencies. However, land-based businesses which do not adapt will struggle to survive.
 - b) ‘AI will both deepen and bridge divides between rural and urban Scotland’:
AI has the potential to increase the enablement of remote working in rural and island communities; improve transport, weather forecasting and connectivity; and help businesses shape themselves around local conditions. It will probably accelerate the homogenisation of rural and island communities but will also accelerate the exclusion of people who do not adapt.
 - c) ‘AI, combined with other technologies such as genetic technologies, has the potential to increase the diversity of crops grown and livestock productivity within the Scottish agricultural system’. Because of its climate, relatively high latitude and relatively small amount of cultivatable soil, Scotland has never been a powerhouse for agriculture. However, new varieties of plants tailored to the environment and soils could improve this and might be essential to the future competitiveness of crop-based agriculture in Scotland. The relatively recent emergence of a fledgling flax industry in Fife is an example which probably needs technological support to be competitive in the long term.

Foresighting the challenges ahead: geopolitical trends likely to influence rural life in Scotland

- 5.10 Many headwinds originate globally. The Ministry of Defence is mainly responsible for monitoring these on behalf of the UK Government (MoD, 2024). Its analysis shows that food and water insecurity will become increasingly prevalent because of climate change, pollution and environmental degradation, and this, in turn, will drive up migration and create parallel stress fractures in traditional political governance. Together with resource and energy stress, the rising power of big corporations, the shift in the centres of global power towards Asia and the slowdown of global trade, this represents a perfect storm of global stressors. When one adds stressors local to the UK associated with an ageing population, high rates of non-communicable and communicable disease, declining competitiveness in trade and high public sector debt, there is an opportunity to contribute something major which counteracts these challenges.
- 5.11 Land is a strategic national asset and the choices made about how it is used are critical to the future health and welfare of a nation like Scotland. But, since a major function of land has been, and remains, the production of food, and food is a highly traded global commodity, the trends within the global food system dictate the trends within Scotland. Scotland is highly dependent on trade in food but the assumption that affordable food for human consumption will always be available within global markets is likely to be challenged strongly.
- 5.12 If SRUC is to have a successful long-term role, it should contribute to meeting the challenge of trends in food production and the use of land. To set the scene in the detail relevant to SRUC, some of the most significant general trends worthy of consideration are as follows:
- a) General trend 1: Global population will continue to increase but at a lower rate towards 2050 (UN, 2024) and it may decline thereafter (Nebel et al., 2024). By 2050 there will be 25% more people on the planet than today. If nothing else changes, people's diets will have shifted towards western-style diets, such as increased meat and grain consumption (OECD, 2025), with low production efficiency causing demand for primary inputs to food production to rise faster than the overall population and probably also than supply. The future path of population, industrial output, pollution and food supply, under 'business as usual' suggests extreme stress in the second half of the this century (Nebel et al., 2024). Current geopolitical tensions are likely to be symptomatic of the early onset of these stresses (MoD, 2024). **Message: the future is likely to see significant global stress and SRUC needs to both be aware of what this will do to demand for its services and, therefore, its own resilience, and be capable of helping Scotland adapt; it can be an opportunity if managed and a risk if ignored.**
 - b) General trend 2: Changes in climate will stress current (traditional) food production systems (Leng and Huang, 2017). Traditional agricultural systems (Jägermeyr and Frieler, 2018), where climate variability is a major factor determining productivity, will become particularly stressed (Anderson et al., 2019). Climate change has already slowed global agriculture productivity growth (Ortiz-Bobea et al., 2021). **Message: SRUC could be leading the knowledge development process about the potential impacts of climate on current and future agricultural production in Scotland and elsewhere, and helping to mitigate the impact on Scotland through its effects on the structure and stability of the Global Food System.**

- c) General trend 3: Agriculture and the food chain are becoming a proportionately greater contributor to greenhouse gas (GHG) production (IPCC, 2019) as other sectors respond by mitigating faster. Indeed, a draft global analysis I saw recently, suggested that agricultural expansion from 1992-2020 had increased food production but at a net cost of about US\$516 billion, i.e. the recent direction of development in the global food system has a negative economic impact. There is currently a correlation between agricultural production and carbon emissions. This means that, based on current practices, under future low emission scenarios current systems of agriculture become untenable because they are hard to re-engineer to reduce their reliance on tillage, fertilisers and heavy machinery powered by fossil fuels. Food waste adds to this problem as does livestock production using traditional methods because of its relatively high GHG production. **Message: SRUC could be at the forefront of technological transformation of food production to reduce its environmental footprint.**
- d) General trend 4: The arable land needed to produce a fixed quantity of crops has declined by about 70% over the past 60 years (Ritchie, 2024) showing the success of the “green revolution” in agriculture, but this revolution is at an end. The apparent efficiency gains in land use have not been matched by increasing energy use efficiency and the focus is now on the energy intensity of food production where 1 calorie of food produced uses at least 5-10 calories of fossil fuel, depending on food type (Pimentel and Pimentel, 2003, Rasul et al., 2024). Current food production has very low energy (Woods et al., 2010) (1-2 parts in 10,000) and resource use efficiency (Defra, 2018) and this may be getting worse rather than better as livestock numbers increase globally. To meet both demand and reduce environmental impact, the current energy efficiency (calories of energy input to calories of food energy output) probably needs to be improved by about a minimum multiplier of 5-10 (or 500-1000%) by 2050. This level of ambition is many times greater than the current incremental rate of improvement in agricultural production due to innovation (OECD, 2025, Ray et al., 2013). It probably does not even compensate for productivity declines caused by climate change (Ray et al., 2013, Chen et al., 2014, Ramankutty et al., 2018, Willett et al., 2019, Ortiz-Bobea et al., 2021). **Message: SRUC could be at the forefront of technological transformation of food production to improve food production efficiency.**
- e) General trend 5: In recent decades the rise of the “global food system” (Godfray et al., 2010b) has been the main driver of efficiency in food production (Godfray and Garnett, 2014), reflected in declining food prices, and increased quality and diversity of food. This is mainly supported by the adoption of extensive agriculture in developing countries, plus trade and food technologies in the down-stream supply chain. The UK is a leader in food technologies which contributes over three times the economic value to the UK compared with agriculture and fishing combined. The trend in offshoring food production is probably the single most significant factor driving biodiversity loss on an international scale (Crist et al., 2017), especially as wealthy countries export food production to places with high biodiversity (Phalan et al., 2011). Market forces gradually shift production to locations around the world where growing conditions are optimal and where land and labour are cheap. **Message: SRUC could support the groundwork to create a system of food production in Scotland so that the people of Scotland are less exposed to global market failures in food.**

- f) General trend 6: Potentially disruptive technologies which merge chemical engineering, synthetic biology, robotics and advanced manufacturing are on the horizon and could shift the paradigm from "food produced by agriculture" to one of "food produced by manufacturing". These technologies include, but are not limited to, vertical farming (Despommier, 2011), synthetic milk (Sethi et al., 2016) and meat (Bonny et al., 2017) products, insect and microbial bioreactors (Sexton et al., 2019), marine algal (Lafarga et al., 2020) culturing, truly closed-loop livestock production (not regenerative farming) and novel packaging. These are likely to provide both high-value food produced close to the point of consumption and high-volume, low cost commodities traded as raw material inputs for food processing. A greater focus on producing protein (WEF, 2019) will be needed. Other disruptors such as precision agriculture which modify traditional agricultural systems are probably not sufficiently transformational alone. **Message: SRUC could be at the forefront of technological transformation of food production to assure supply within Scotland and elsewhere, and to do this without ruining the environment.**
- g) General trend 7: In tandem with technology change, most people have also adapted to eating processed foods (Monteiro et al., 2013), driven by the need for convenience, and this is an upward trend (La Vecchia and Majem, 2015). The evidence shows that people shift their diet as new types of food become available. Price is a major driver of food choice and taxation can shift behaviours (Lo et al., 2009). Food reformulation (reducing salt, sugar, fat), as well as behaviour, can be a major driver of health trends (Lo et al., 2009). **Message: SRUC could lead a change in culture towards food and involve itself in the debates concerning 'processed' food.**
- h) General trend 8: Land values will increase as pressure for access to land for food production increases, known as "land-grabbing" (Rulli et al., 2013). Traditional food production systems will mean that increased resource extraction from land and sea will place new pressures on wild habitats (e.g. rainforest (Drescher et al., 2016)) and fish stocks (e.g. krill (Olsen, 2011)). Cities will be larger and will be the focus of food demand and will have an environmental footprint rising at a faster rate than their populations. Despite this, the world has passed "peak land" (Ritchie, 2024) and there is increasing land abandonment because marginal land once used for agriculture, mainly in the richer global north, is no longer economical to use for food production or because it has become infertile. This is a pattern which is visible within Scotland and land is increasingly viewed as part of the service economy, rather than the production economy. These services vary from providing carbon storage to recreation, including activities like golf. **Message: SRUC could refine the rationale for how services from land are valued.**
- i) General trend 9: The dynamics of the "global food system" is potentially challenged by the reliance of mega-cities in the global south (GoScience, 2011) on global commodity trade and the absence of stress-testing of the systems against shocks. The Ukraine crisis has sharpened national appreciation that food supplies are a critical issue of national security. China ensures its supply by out-sourcing production (Gooch, 2018) but is such a dominant player within the global food system that it can dictate terms. Countries, such as the UK, which rely on food markets for food supply need to plan for instabilities within the global food system and shortage of supply. Neither the UK nor Scotland have strategic plans in place to maintain food supplies at times of crisis. **Message: SRUC**

could lead policy change at a Scotland-wide level and possibly beyond Scotland's borders.

Foresighting the challenges ahead: Scotland's rural economy

5.13 In addition, specific and relevant trends within Scotland are as follows:

- a) Scottish trend 1: Demand for land-based resources in Scotland is generally increasing and the way land is managed in future is a key to Scotland's prosperity, and to its ambitions for environmental sustainability (FMEC, 2023). This is because of the need to produce food using land for agriculture and because land is increasingly important in the supply of services, such as clean water, carbon storage and recreation. Strong trade-offs exist between these uses and it will be challenging to manage transitions to different, more diverse forms of land use, as the emphasis on traditional production involving forestry or agriculture changes. **Message: SRUC can (and does) play a central role in transitioning expectations and cultures around land use within Scotland by helping to both create more diverse value systems and advising land-based businesses about the transition options available to them.**
- b) Scottish trend 2: The agricultural economy is in decline in absolute and relative terms. Farm incomes have not grown in the past decade and are mostly below break-even without subsidy (ScotGov, 2025a). This reflects the picture more generally in the UK (Batters, 2025, Defra, 2019) and incomes in agriculture, forestry and fishing are the second lowest of any industrial sector (CIIP, 2026). The rural economy in Scotland accounts for about 26% of the total economy (Scott, 2024, ScotGov, 2025c) and this percentage has been stable over at least the past 10 years (RESAS, 2025). Food and drink currently accounts for about 7% of the Scottish economy which is well below that for the UK as a whole. The rural economy overall mainly supports the services sector (including tourism) which accounts overall for 77% of the Scottish economy (ScotGov, 2021). However, agriculture, forestry and fishing currently account for only about 2% of GDP (ONS, 2025) and this is in decline. **Message: SRUC can aim to reverse the declining trend of food production from the rural sector by developing alternative, sustainable solutions to those currently in place, and which play to the unique strengths of Scotland's rural regions, particularly in terms of access to locally-generated renewable energy and ample clean water.**
- c) Scottish trend 3: Scotland is likely to be increasingly uncompetitive in food production and forestry within global markets. This is partly because of Scotland's small scale and its northerly latitude, meaning that it has a relatively short growing season. In a global market, it will therefore struggle to compete with places which have better growing conditions. This is offset to some extent by supplying to specialist, premium markets but these will always be limited in scope, and may be volatile. Low competitiveness is also caused by an industry structure (especially in farming) which favours small businesses with low capital investment and low innovation capacity when compared with larger-scale, corporate businesses which are more typical of other major industrial sectors (e.g. energy, transport, communications, construction). Government support to agriculture has been in long-term decline (ScotGov, 2025b) and concerns about affordability, fairness, and propriety associated with this form of support will further reduce the political and economic capacity of governments to support this industrial

system through subsidy in future. The least subsidised sectors of agriculture (e.g. fruit and vegetables) are the most profitable parts of the farming sector. They have been expanding and are mainly limited by the availability of migrant labour (SEFARI, 2025).

Message: SRUC can help to reform agriculture in Scotland to make it profitable even within competitive global markets.

- d) Scottish trend 4: A key reason for government providing support to farmers has been to support local food production. In recent decades the rationale for this has shifted from concerns about food security to concerns about sustaining viable rural communities, but this trend in rationale is beginning to shift back to consideration of national food security and this issue is likely to rise in importance because of geopolitical uncertainty. At the level of individual citizens, food security in Scotland is declining but the reasons for this are related to complex social circumstances and have little to do with that actual abundance of food or how or where food is produced (Defra, 2021, Trussell, 2025). Currently only 21% of calories produced in Scotland are used for human consumption and much of the remainder goes to distilling and as fodder for livestock (ScotGov, 2023, SWA, 2025). Most of the staple foods used by people in Scotland are imported. Despite this, at national level, Scotland is a relatively food secure nation (GFSI, 2022), mainly because of its capacity to trade within the Global Food System. Geopolitical stress (MoD, 2024) and increasing risk of system failure (Gaupp et al., 2020) are increasing Scottish Government focus on how to mitigate the risks of food system failure.

Message: SRUC can help Scotland develop the policies and technologies which make better use of land as a strategic national asset used for food production to benefit the people of Scotland more directly.

- e) Scottish trend 5: Trends in the recreational value of land in Scotland present a complex picture (ONS, 2023). The number of people seeking recreation in the rural environment has been increasing rapidly but expenditure to support this function of Scotland's land has declined by almost the same percentage amount. The largely 'free-to-access' landscape of Scotland appears to be a considerable attraction but this does not return the revenues needed to maintain these assets. This is illustrated in the peri-urban setting by the closure of many public golf courses. However, golf in particular is an important part of the regional economy and is especially important in NE Fife. Overall, it supports about 20,000 jobs and it contributes to the Scottish economy as a service at a level close to that of production agriculture. **Message: SRUC can argue for better systems of land management and improved policy to recognise and reward land manager and owners for the public benefits they provide.**

Scottish context: higher and further education, and research

- 5.14 Scotland has a large higher education sector with several globally-relevant universities. On a global scale, universities in the UK are declining in competitiveness and this includes Scottish institutions. Both its universities and its colleges are under a lot of current financial stress and this includes SRUC (AuditorGeneral, 2025, SFC, 2025). The business model associated with paying for much of the costs of universities using overseas student income is largely broken. Student markets, like that in China, have also declined. China²² is now

²² Only 12 years ago, China qualified for overseas aid from the UK in agriculture. Now, it is well ahead of the UK in terms of its capabilities and, if anything, the UK has much to learn from China. Rather than UK

overtaking the UK in terms of its own know-how in key sectors (including agriculture) and in the quality of its universities and colleges. SRUC is the only dedicated educational and research establishment in Scotland which is designed specifically to support the delivery of skilled people to support the rural economy.

- 5.15 The Scottish Government has recently introduced legislation that includes mechanisms enabling greater integration and support for private provision within the tertiary education sector, specifically regarding student funding²³. The Act represents a shift towards a more flexible definition of "tertiary education" that officially includes private, independent, and voluntary sector providers alongside public institutions. This shift could be a significant opportunity for ambitions in NE Fife involving the alignment of private capital investment with government policy.
- 5.16 All advanced economies need higher education and research which services the agricultural economy. For example, in the United States, this comes mainly from the large "land-grant" universities established in the 19th Century and which are at the core of the US higher education system. There are 42 of these and many have familiar names like Iowa State, Washington State, Cornell, Texas A&M, Purdue and Ohio State. They attract high levels of public funding and represent the academic component of an academic-industrial-government complex which results in a close relationship between the strategic national interests of the US, academic activity and practical implementation of food production and processing technologies. Arguably it has resulted in the most successful agricultural industry ever created. Other models also include specialist universities, such as the Georg-August-Universität Göttingen, University of Hohenheim, Technical University of Munich and Leibniz Association Research Institutes in Germany; INRAE²⁴, AgroParisTech²⁵, and CIRAD²⁶ in France; and Wageningen University & Research in the Netherlands which is perhaps the world-leading technical university in agriculture.

universities teaching students from China, the future flow of student talent is likely to be in the opposite direction so SRUC needs to see Chinese institutions as potential competitors.

²³ The Tertiary Education and Training (Funding and Governance) (Scotland) Act (<https://digitalpublications.parliament.scot/ResearchBriefings/Report/2025/4/24/7a2da067-3dd8-4798-872b-fc8cf49665fc>), passed in January 2026, aims to streamline the skills and training landscape. Key points regarding private provision include:

- a) **Designated Providers:** Part 3 of the Act establishes a legal mechanism for private providers of further and higher education to become "designated providers". This enables Scottish-domiciled students attending approved private providers to access public student support.
- b) **Wider Definition of "Fundable" Bodies:** The legislation, as interpreted by critics such as the EIS union, allows for the designation of all private providers (in Scotland and the rest of the UK) as bodies that may receive public grants.
- c) **Concerns Over Public Funds:** While the government framing focuses on supporting students and simplifying the landscape, the legislation has raised concerns among unions that it opens the way for more private education providers to receive public money.
- d) **Context of Financial Strain:** These changes come amid significant real-terms funding reductions for public colleges and universities, increasing pressure on institutions to seek alternative income sources. .

²⁴ Institut national de recherche pour l'agriculture, l'alimentation et l'environnement, the National Research Institute for Agriculture, Food and Environment

²⁵ Institut des Sciences et Industries du Vivant et de l'Environnement

²⁶ Centre de coopération internationale en recherche agronomique pour le développement

- 5.17 The UK has progressively down-graded its equivalent investments over many decades. A signal moment was when the Agriculture and Food Research Council was, in effect, abolished in 1994. The UK has had no consistent government leadership in the field for many decades resulting in institutional decay and the latest strategic view from the UK government says nothing about the criticality of food production as an essential component of national welfare and security (DSIT, 2025). This is a surprising and worrying situation reflecting long-term dissonance at the highest administrative levels in government, irrespective of their politics, about the criticality of food policy. Agricultural research is at least as important to humanity as medical research but it attracts an order of magnitude less funding in the UK. This as a significant national strategic weakness and SRUC needs to have a role in turning this around.
- 5.18 The Scottish Government has tended to show more leadership in food policy than the UK government. It has published a National Good Food Nation Plan²⁷ which sets out six objectives covering access to food, food system sustainability, and the importance of food for the health and welfare of people. This is built on framework legislation in the form of the Good Food Nation (Scotland) Act 2022 which also establishes the Scottish Food Commission to advise the Scottish Government about food policy. There is a need for a SRUC to underpin this with excellent education and research.
- 5.19 Despite the evidence that the Scottish Government understands that there is a problem with food policy which needs to be resolved, the actions taken have not, in practice, addressed the underlying policy weaknesses. One of these is the huge influence of global markets on food which the Scottish Government has virtually no control over but others are reflected in two issues which do need to be resolved:
- a) Weakness within leading academic establishments which tend to be ‘strategy takers’ rather than ‘strategy makers’. The UK (including Scotland) will probably never resolve its structural problems, many of which are in areas well beyond agriculture and land use, until this balance changes. In reality, the short-term nature of political cycles means that government is not a good vehicle to carry long-term responsibility for strategy.
 - b) A strongly politicised farming lobby, usually delivered via the NFU and NFUS, which forces strategy to maintain the business viability of the majority of members, most of whom represent small businesses whose existence depends on government subsidy and preservation of the *status quo*. This results in a highly conservative bureaucratic/political response and a lack of political headroom to enact radical change.

SRUC should be at the forefront of arguing to change both these circumstances and build a food production capacity in Scotland which reduces its reliance on global markets.

- 5.20 There are a small number of small specialist institutions in the UK, like Harper Adams University and the Royal Agricultural University (formerly the Royal Agricultural College)

²⁷ <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2024/01/national-good-food-nation-plan/documents/national-good-food-nation-plan/national-good-food-nation-plan/govscot%3Adocument/national-good-food-nation-plan.pdf>

which, together with SRUC, straddle the needs of further and higher education. The University of Reading has a presence in agricultural sciences and others like Aberdeen, Aberystwyth, Newcastle, Edinburgh and Leeds maintain research and teaching, but all at sub-departmental level. Beyond SRUC itself, I do not believe there is any higher education institution in Scotland offering degrees in agriculture.

- 5.21 The University of Lincoln has recently developed itself as a centre for agricultural technology, especially robotics. But the weak policy environment on food has forced the University of Nottingham to consider closing what little remains of its agricultural interests at its once internationally important Sutton Bonnington Campus which was once dedicated to agricultural research. The only remaining location in the UK where broadly food-related research happens at any significant critical mass is on the Norwich Research Park alongside the University of East Anglia where the John Innes Centre, Quadram Institute and Sainsbury Laboratory are located. Aspects of the work at Norwich, especially the John Innes Centre and the Sainsbury Laboratory, which often work in tandem with Rothamsted Research in Harpenden, have globally-leading research in crop genomics but, in general, these gems struggle to sparkle because they are not embedded in a strategic industrial-academic-government complex with a unified purpose.
- 5.22 In Scotland, besides SRUC, the James Hutton Institute (JHI) provides research support for land- and agriculture-based industries. It is located at sites close to Aberdeen and Dundee and has some level of integration with local universities but is largely government-funded, delivering mainly to a research agenda developed by the Scottish Government. This amounts to a modest public investment although it does reflect a more strategic approach by the Scottish Government to supporting agriculture and food than is present at a UK level. However, little strategic clarity exists about the relationship this investment has with the creation of SRUC. Both are part of the Scottish Government's SEFARI concept which makes them eligible for Scottish Government research funding which is subject to some strategic planning. But in my view, the complimentary strengths of both institutes are not backed up by efforts to create critical mass in research and education which is going to shift the dial to meet the challenges detailed above.
- 5.23 Of all the international models referred to above, Wageningen is probably the most relevant to Scotland as a template to follow. It combines educational needs with academic research in an environment also inhabited by private sector organisations some of which are represented by some of the largest global agri-tech businesses. It represents a strategic partnership between government, business and academia. The result has been that Dutch agriculture is technically the most advanced in the world and leads the world in terms of agricultural efficiency and yield for specific high-value crops. The Netherlands is the third-largest exporter of agricultural products (after the US and Brazil) by value overall. Even if the soils in the Netherlands are rich compared with Scotland, it reflects what can be achieved even by a nation of modest size with appropriate levels of investment in teaching, research and innovation when that investment is focussed on national advantages.
- 5.24 Competition between FE colleges internal to Scotland has resulted in perverse actions involving, for example, the 'displacement' of an educational activity from one place to

another; the creation of multiple centres of activity none of which is individually economical to deliver given the level of demand; or the removal of educational services from a region because it is notionally served by another provider²⁸. These are examples of tactical behaviours on the part of different institutions resulting from poor strategic coordination – another manifestation of ‘institution first, people second’. Creating internal competition within Scotland between institutions simply undermines their purpose..

6. Analysis

General synthesis

- 6.1 This section synthesises the picture drawn in the previous sections of this report. I attempt to re-frame the question of how to deliver the highest quality HE, FE, research and innovation in land-based subjects in the interests of Scotland while not losing focus on the emergent problems in NE Fife. This is an attempt to reflect a more sustainable model which is competitive at an international level while also delivering to local needs for further education.
- 6.2 The following summarises the high-level conclusions from the foregoing futures analysis:
- a) Key aspects of the world are changing faster than ever. AI in particular is going to force very rapid change on people and educational systems, and on the innovation systems which they support. The pace of change will leave many people behind, but institutions like SRUC need to be structured to both respond increasingly rapidly to these changes and to help people move with those changes. Shifting baselines will mean that many people who are making judgements in the present about what is right for young people (generally older people) will be wildly out of touch with those needs. **Conclusion: SRUC needs to be a highly agile institution which fully embraces rapidly changing and technologically-driven work practices and have a laser focus on ensuring people can be helped to adapt to a rapidly changing world.**
 - b) Food represents a particular stress line within society and Scotland is vulnerable to failures in food supply. This happens both because of the costs of food and the lengthening supply chains which nobody fully understands but which are very vulnerable to disruption, are not as robust as is commonly assumed and are more or less controlled by powers which could be hostile. Scotland’s particular vulnerability happens because local food production capabilities are geared to supplying a broad global market for calories rather than local needs for food. Extreme inefficiencies in how food is produced and used in Scotland are also leading to gradual loss of competitiveness within those wider markets. Food system transformation is needed in Scotland, just as it is in the rest of the world, to neutralise the currently existing trade-off between making food for people and wrecking the biosphere. Consequently, Scotland faces the triple challenge of having a food production system that does not supply to the needs of people, which is also declining in its fitness to supply to wider markets, *and* which is degrading the very

²⁸ This has occurred in particular in relation to the University of the Highlands and Islands setting up courses in competition with SRUC. Examples include courses in golf course management and the “Scottish School of Forestry” near Inverness. I also see that Borders College provides Land-based and Rural Skills studies at its Newton St Boswells campus.

environment which people rely on for survival. **Conclusion: Both the technology and policy challenges resulting from these serious problems need to be grasped and SRUC should to be leading the resulting industry reform and transformation.**

- c) Current educational structures within Scotland are a very long way from the state needed to service the needs of the people of Scotland, and SRUC is a part of that picture. Some other nations have done a much better job of constructing the educational and research pipelines needed to support the critical land-based industries (including “green” skills) needed and they could be useful examples to emulate. **Conclusion: SRUC should be the leadership organisation to ensure that the need for “green” skills and knowledge is constructed as a pipeline supporting both technical and policy innovation.**

6.3 These are contextual challenges but I also see SRUC being faced with a range of key strategic and operational challenges in the fulfilment of its charitable objectives (Appendix 2) and mission. I deal with each of these classes of challenges separately but meeting these challenges is going to be an important part of finding a robust solution to the dilemmas it faces in NE Fife. I acknowledge that any FE or HE institution will be confronted by many of these kinds of constraints but, in the case of SRUC, some are exaggerated by its relatively small size and the confusion about its status as an FE and/or HE institution.

6.4 Strategic challenges:

- a) SRUC is part of an increasingly dysfunction FE and HE sector in Scotland. This arises partly because of significant politically-induced constraints on how these institutions operate against a background of a rapidly changing market. The resulting lack of flexibility leads to institutions which have trouble finding ways of reducing the cost-base of public education. Arguably, money is not used within the FE/HE sector as well as it could be and this is a systemic issue arising from a wish, on the part of governments, to control the market while trying to avoid paying the costs of the inefficiencies this creates. It is beyond the scope of this report to solve these sector-wide problems but, assuming that the scale of public funding is not going to increase (and may even decline) in future, the onus is on institutions like SRUC to solve the problem either by increasing income (what I call “chasing the money”) or reducing costs without loss of the level of service and, therefore, increase efficiency. I do not think that “chasing the money” and reducing costs are mutually exclusive but I suggest that, in general, “chasing the money” becomes easier if the cost-base of the organisation is properly optimised. This can generally be done in several ways:
 - i. Creating greater critical mass by amalgamating educational services to teach larger cohorts of students with fewer resources;
 - ii. Using technologies, especially AI, to both improve the learning environment, to tailor learning to the individual needs of the students and to streamline assessment;
 - iii. Shifting the role of the ‘teacher’ or ‘lecturer’ (i.e. the expensive component in the system) to provide more personalised support for students where contact with students will vary depending on the student preference and ability. This could be called a “risk-based” approach to teaching which would focus costly contact time on high value outcomes rather than basic knowledge delivery and student performance assessment which can be delivered using technology solutions.

- iv. Taking ‘place’ out of the equation. While there will always be a need for physical infrastructure (which needs to be local for some students), it needs to be of a different size and distribution to traditional teaching. People need have opportunities to learn in the workplace, from home, or in dedicated facilities depending on their choice, subject or requirement. The very confusing ‘place-based’ misnomer used by SRUC needs to change because place is an increasingly redundant concept.

This could be described as “*personalised, low cost, high tech*” education but needs to be designed to reduce the main cost-base involved in teaching at FE/HE involving salaries and built infrastructure whilst sustaining or improving standards. SRUC needs a focus, and a plan, to shift rapidly in this direction and its approach to Elmwood could set the tone for how to do this.

- b) At the same time, SRUC should not be acting on its own. The FE/HE sectors are crowded landscapes and adding competition to this mix just adds pain for almost no gain. SRUC needs to understand, much more clearly than is currently evident, how it fits into the wider research, innovation and educational landscape of Scotland. In particular, it needs to be very clear about where it can add value rather than be perceived (and often actually is) a competitor with other competent Scottish institutions. If SRUC was to ask “what can it do to add most value with the resources at its disposal?” it would probably come up with a very different solution to the delivery of the educational needs of the populations it serves.
- c) It is, therefore, essential that SRUC finds governance structures which mean it can work in meaningful ways with other FE suppliers (including both public and private bodies) to deliver FE in NE Fife, and most likely right across Scotland. The solution for Elmwood should be created as a generic solution for many other circumstances across Scotland and which could apply equally in FE and HE more generally.
- d) There is a pressing need for rapid transformation in the land-based industries. A greater effort is needed to change both the technical functions of food production and the policies which create an enabling context from the adoption of technological change. SRUC’s current R&D capabilities are generally focussed on making the *status quo* slightly better rather than on transformational problem solving. I suggest this needs to change and it also needs to reflect a upgrading of the ambition for HE in SRUC.
- e) The long-term chronic decline in traditional land-based industries, especially agriculture, means that those industries themselves are not in a strong position to invest in their own futures through innovation, research or education. Even if public money is very constrained there is a significant supply of private money but relatively little finds its way to investment propositions within the land-based sector. Constructing attractive investment propositions for land-based industries is going to be vital if they are to thrive (see Section 8 for suggestions in relation to NE Fife). There is a critical need to build a Scotland-centric strategic business case for investment as well as policy reform in the land-based economy.

6.5 Operationally-focussed challenges:

- a) The “SRUC model”²⁹ involving end-to-end “tertiary” education together with a dispersed (so called “place-based”) structure adds substantially to the operational

²⁹ This was how the SRUC senior management referred to SRUC’s operational philosophy involving post-secondary education which can take students all the way from the lowest level of qualification to the

costs and these are not compensated within the public funding provided to SRUC. These costs rise further because of the small scale of SRUC as an institution and because most of the SRUC estate is old and dilapidated. The capital grants from SFC are orders of magnitude below what is needed to maintain them let alone restore them.

- b) While I can suggest that institutions should be working more in collaboration with each other, this is sometimes much more difficult to achieve in reality. However, SRUC needs to take a lead in demonstrating the establishment of governance structures which ensures all partners are treated fairly. This happens regularly within the private sector and there is no reason, other than mindset and culture, which cannot make it work within the quasi public-sector setting of FE/HE institutions.
- c) Belief and trust in SRUC is very low, at least in some quarters, and this affects SRUC's credibility and reputation and this clearly needs to change. SRUC needs to work hard to build trust and be prepared for this to take a long time.

Future strategy

- 6.6 SRUC probably needs to reconsider aspects of its strategy. Some features of its strategy are aligned strongly with many suggestions within this report, but there are important differences. The strategy itself is so strong on ambition in places that it lacks credibility and it would be hard to pin down some ambitions to verifiable outcomes. Others are clearly beyond SRUC's scope of achievement in any rational time frame and it is also short on realism about strategic and operational challenges (see above) and how these are going to be tackled. There is little or nothing in the strategy about how SRUC will develop the funding flows, business systems and leadership structures to deliver. I recommend that, in due course, SRUC should update its strategy after appropriate consideration of these issues.
- 6.7 The need for rapid evolution in the land-based economy of Scotland, especially in the area of agricultural productivity, should be obvious to all. Current rates of innovation do not keep up with the challenges of remaining competitive within world markets and much of the productivity from Scottish agriculture does not benefit the people of Scotland. Added to this, farmers struggle to make money and most rely on public subsidies to get by. Yet, at a time when there is declining availability of public funding to support this industry, there is an ample supply of private funding looking for a good investment. Scottish agriculture fails, in general, to create compelling investment propositions to attract this private funding. I suggest it should be SRUC's mission to reverse the polarity of investment in Scottish agriculture from one dominated by government handouts to one which is attractive to private investment. When taking on this mission, I also suggest SRUC deserves the support of the NFUS and other agricultural interests in Scotland.
- 6.8 Based on the limited scope of my inquiry, I am not prepared to go beyond a broad, speculative suggestion for how SRUC could evolve (see Appendix 9). My consultation showed how much people care about SRUC and some people were prepared to share their view of what SRUC could be in future.
- 6.9 One speculative future for SRUC, which I think needs to be considered seriously, is to split SRUC into separate FE and HE institutions because, at present, SRUC is disadvantaged by attempting to capture both functions within a single institution.

highest within a single system. In the case of SRUC, this is delivered across multiple locations around Scotland.

- a) Again, speculatively, SRUC(HE) could be based out of its Edinburgh campus and partner with the University of Edinburgh, which has strong synergistic interests³⁰. This would also accelerate SRUC's ambitions to rise rapidly in the global university rankings as stated in its current strategy. Scotland needs to be the custodian of degree-level qualification in agriculture at the highest level and it would be a fast-track way of achieving elevation. It would also have the advantage, at least in my view, of combining the visions which SRUC has created for a vet school with a world leader in that subject and to mitigate much of the risk which SRUC has created by investing in a vet school.
- b) At the same time SRUC(FE) would then be free to pursue the important need to promote the delivery of FE from within the current FE college structure across Scotland including in NE Fife.

Assumptions for the remainder of this report

6.10 For the remainder of this report, I am assuming that the foregoing analysis is broadly accepted. If it is not accepted, then I suggest that those who wish to dispute it need to do so based on a reasoned, and reasonable, argument. However, it does mean that much of the remainder of this report is irrelevant for those who would dispute the foundations upon which it is structured.

FE in NE Fife and at Elmwood

- 6.11 Elmwood is a consolidated component of SRUC's balance sheet and this has implications for how the SRUC Board can proceed. It is their duty to ensure that the value of this asset is sustained. I have encountered a number of suggestions about an asset transfer of the Elmwood site to, for example, the Cupar Community Development Trust. For this to happen, SRUC would need to accept a net loss of assets and I suspect that would only be feasible if the Elmwood site was a net liability on the SRUC balance sheet. In addition, SRUC would need to satisfy itself that those organisations receiving the assets would need to be clearly more capable than SRUC of turning these assets to public benefit and that they could cope with the liabilities they would be accruing. While not impossible, it is hard to see this happening.
- 6.12 SRUC should, therefore, instigate a recovery project for Elmwood by convening a high-level working group including senior individuals from the Scottish Funding Council, Fife College, Dundee & Angus College and Fife Council. Collectively (with the possible exception of Dundee & Angus College) these institutions, which I call the "project group", have been responsible for placing Elmwood in its current state. These are the organisations which have most direct responsibility for Elmwood and I suggest it is incumbent on these actors to put their weight behind this initiative. This group should, among other things, produce a master plan for the Elmwood site and a business case for its re-development. I suspect that a capital investment of at least £15 million will be needed to redevelop Elmwood as a community college asset if that is the conclusion of the process.

³⁰ See the University of Edinburgh's Global Agriculture and Food Systems centre (<https://vet.ed.ac.uk/global-agriculture-food-systems>) which is based out of its veterinary school but would probably benefit from being broadened by inclusion of SRUC expertise.

- 6.13 In order to ensure that accountabilities and focus are not lost, that progress is sustained and trust is built, I recommend that a “consultative group” is established from within the NE Fife community. This group should be used by the “project group” to provide rapid community feedback on the plans under discussion. The members of the “consultative group” should be able to view all minutes and there should be at least one meeting every six months involving both the project and consultative groups. If possible, it should provide an annual report to the convener of the Education, Children and Young People Committee of the Scottish Parliament (assuming it agrees).
- 6.14 These groups should be established with a view to shifting them in due course to become formal bodies established under Company Law which would be responsible for implementing the solutions developed. See Section 7 of this report for more discussion of group company structures.
- 6.15 It is beyond the scope of this report to investigate all the scenarios for Elmwood which could be on the table. These include, for example, partial sale of the site to raise some of the capital to re-develop the remainder; full transfer of the asset to the community which then takes on responsibility for re-development; complete sale of the site and re-investment in a new facility in another location, such as on the University of St Andrews Eden Campus at Guardbridge³¹; plus many others. It would be important to place all options on the table at the start and to carry out a transparent and objective assessment of the costs and benefits of each.

7. Strategic business model

The group model

- 7.1 As a charity, SRUC already has experience of operating a ‘group’ company structure. Appendix 10 expands on this as a theoretical example of how such a solution could be established for Elmwood. Many charitable companies have a ‘commercial arm’ which acts as a holding company, often employing nobody directly itself, for commercial ‘trading’ activity which, for tax and other reasons, cannot lie within the charity. The current SRUC model, involving SRUC Innovations, has much in common with this model.
- 7.2 The *commercial arm* model works well if a relatively small amount of the business being conducted by the charitable (or *parent*) company is channelled through that governance route. However, for SRUC, current commercial activity is over one-third of the total turnover. This needs to be dealt with using a deliberately-constructed and well-disciplined *group model* because, in order to flourish by using normal business practices – including taking on business partners in joint ventures, having share-based ownership, incentivising individuals and taking on debt – the businesses owned by the charitable company need to have relative autonomy. This includes greater financial and reputational distance from the *parent*.

³¹ The University of St Andrews would be willing to entertain this option should it emerge. Guardbridge has the advantage that it has very good transport links to the rest of NE Fife and to Dundee,

- 7.3 Parcelling businesses as *subsidiaries* within a *group* structure also means that, should the charitable company ever wish to sell its share in any of these business, then it can do so with relatively little administrative complexity. It is a common method used by capital funds which operate across many different business. However, the *group model* also allows charitable companies to partner with other charities or even with public bodies in a company limited by guarantee and this is a structure SRUC should be using more for the delivery of FE with partner public sector institutions. It is the model I suggest should be developed for delivery of a rejuvenated Elmwood..
- 7.4 One of the strengths of the *group* model is that it limits risk and, in particular, it limits risk spreading throughout the *group*, so long as the companies are established with this limitation of risk in mind. Risks associated with the *group model* mainly concern reputational and financial risk. Reputational risk often materialises where the brand of the *parent* charitable company is associated with a *group* company which trades on this brand but does not hold to the values and standards of the *parent* company. Financial risk happens when *subsidiary* companies accrue debt with a liability which is not limited to that company (e.g. where the *parent* company has acted as a guarantor for the debt), or when the *parent* company invests capital in a *subsidiary* company which then trades in a way which reduces the value of that capital. A further risk for the *parent* company is that a large proportion of its assets might be tied up within subsidiary companies thus creating problems of liquidity.
- 7.5 The skill associated with managing a portfolio of subsidiary companies involves finding a balance between overbearing shareholder oversight through representation on company Boards and allowing subsidiary companies free rein to find their own fortunes within particular markets.

Starting small, stay small, thinking big, act big – be lean

- 7.6 Five main ingredients seem, at least to me, to be essential for any future business option:
- a) Create the right attitude of mind. This involves a ‘start small, stay small, think big, act big’ approach. This is really part of the “lean” methodology of business management. In this respect the key ingredient is to invest in high quality individuals to lead projects or companies.
 - b) Create the structures which can most easily access private capital thus minimising the need to call on public sector support which is very strictly limited and is likely to become more so in future. Where public sector support is sought then any business case would need to articulate a strong argument for the delivery of public good.
 - c) Decouple any future development as much as possible from the effects of government controls. The evidence shows that the uncontrolled presence of the hand of government means having lack of clarity of governance, purpose and focus caused by fuzzy contracts for the delivery of services³². This does not, of course, mean that these developments should be decoupled from public interest; indeed, the precise opposite can be the case based on the objectives of the *parent* which has charitable status.
 - d) Empower and unlock local latent creativity and talent (e.g. within the staff at sponsored institutions such as Elmwood); to give people opportunity in diverse ways

³² I am referring, in particular, here to the “outcome agreements” with the SFC especially for those associated with FE delivery.

which best fits their ambition and circumstances but which, when aggregated through a *group* structure, add up to a significant net boost to the quality of people's lives and the local economy. It is very difficult to do this within a single monolithic organisation focussed on nationally-scaled impacts.

- e) Enable the widest possible involvement of talented people in governance. One of the useful things about the 'group' structure is that it is possible to engage people as non-executives directors within the group, thus drawing on their talent and experience, giving them new and rewarding experiences and making them disciples to the cause.

The point is to design operational efforts to maximise the efficiency by which outcomes are achieved. In general, the larger organisations become the more difficult this is to achieve. Creating a 'group' approach comes with challenges involving added overheads, reduced control and added risks but, as I have already said, these can be anticipated and controlled.

Applying the group model

- 7.7 The rationale for such a major change is strong. SRUC needs to find ways to unlock itself from reliance on sources of public funding which carry unreasonable expectations, exemplified by not paying a reasonable economic rate for educating students. SRUC needs to ensure that it constructs a service to students and other customers which is proportionate to the costs while relentlessly weeding out inefficiencies.
- 7.8 The group model is most easily envisaged when it comes to the supply of expert analysis, consultancy and analytical services to existing markets. This is where SRUC has already been active. However, it has not traditionally been applied to the delivery of HE, FE and to academic research. I am suggest that the norms of business in this sector need to change by adopting the group model. For example, in order to engage fully with both the public and non-public elements of educational capability within NE Fife, it will require business structures which recognise the needs of different parties so that they can all work together. In these circumstances, all options for structuring relationships should be on the table, from simply contracting for services, to joint ventures (JV), formal partnerships and the possibility of merger and acquisition. For example, having established a joint venture with other institutions to deliver FE in NE Fife, at some point in future it may be most appropriate for SRUC to sell or gift its interest and to move its focus elsewhere. Packaging the JV as a company limited by share makes this option more feasible.

8 Potential investment propositions

- 8.1 There is a strong imperative to make land-based industries work much better for the economy and for the health and welfare of people, including their security. I cannot overstate the urgency there is to correct the current state of relative political and academic indifference there is towards these subjects because they are foundational to the stability and resilience of society.
- 8.2 I was asked to provide my view of what SRUC could focus on if it invested in NE Fife and the following 'opportunities' are my best assessment. They are not a complete set and other

observers might come up with different priorities, but they are a start. I am not suggesting that SRUC could focus on all of these simultaneously.

- 8.3 As I have already suggested, to ensure that the opportunities detailed below are seen as part of an integrated whole, it is essential that SRUC develops an overarching strategic assessment³³ which ensures prioritisation of investments in subjects and infrastructure which addresses the most pressing problems for Scotland. Inevitable, if SRUC is focussed on Scotland's needs, this will also translate to some extent to international contexts, but I suggest that SRUC should focus on Scotland and then the wider world.
- 8.4 Sections 5 & 6 of this report are an attempt at such a strategic assessment although do not replace the need for SRUC to do this itself and in partnership with its staff and stakeholders. The viability of the following opportunities, which would normally be contingent on them emerging from a detailed strategic assessment, is only as good as the analysis I have provided in Section 5 & 6.
- 8.5 Six main opportunities have emerged:

Opportunity 1: Education from the community, by the community, within the community

This opportunity requires the joint action of the public bodies, plus SRUC, included in the NE Fife 'project group' (see Paras 6.12-6.13). It would be for those bodies to work to square the circle of funding needed to rejuvenate Elmwood, or an equivalent local capability in NE Fife.

They will need to address two connected challenges involving (a) securing capital funding to ensure that there is new and fit-for-purpose educational infrastructure and (b) to demonstrate sufficient operational funding to maintain the facility and deliver its educational objectives.

It is not for me to construct how the business case for this should look but it would almost certainly have to include a mixture of publicly- and privately-funded student places, and of public and private capital. If the publicly funded places come at well below the economic costs then other arrangements would be needed to ensure capital funding from public sources was made available to support those places. There needs to be a robust and disciplined approach to controlling the tendency of public institutions acting to coerce a private institution (such as SRUC) into subsidising public goods with private goods³⁴.

However, there should be an ambitious plan to create a highly cost-efficient institution. This would, for example, minimise the Gross Internal Floor Area (GIFA) per FTE. It could probably be less than the 5 m² which is normal for large colleges in Scotland (See Figure 1a). This should be achievable by the adoption of AI to programme space use and using a mixture of in-person and online teaching and assessment.

³³ It might be possible to use this report as this assessment, but I would not be confident that the methodology has been robust.

³⁴ This cross-subsidy process is what has happened in HE in the UK and in the long term it distorts the market creating unsustainable businesses.

The resulting capital costs of ~£13 million for a capacity of 1,500 students (assuming a cost/m² of £1,750) would result in an annual depreciation (assuming it is linear over 30 years) of ~£0.4 million. Annual operational and maintenance would be about ~£1.1 million (assuming ~£150/m²). Added together, this would mean that the cost per student of a new building at Elmwood with the same capacity as the current building would probably be about £1,000 per year amounting to about one-fifth and one-eighth of the public funding provided for FE and HE respectively.

Ideally, the main building at Elmwood plus the horticultural facility should be re-built as a new, state-of-the-art facility which can cater for a broad range of FE, including FE in land-based studies.

I suggest a development company needs to be created to take this prospect forward and to own the building and possibly the site and that the value of those assets should reflect SRUC's shareholding in that development company. It should be for the development company to build the investment and business case to raise the capital funding and to demonstrate the revenue sources needed to operate the facility into the future. The development company could be accompanied by a charity whose function would be to raise philanthropic funding to support scholarships although I also think this is a function which SRUC itself could carry out. A separate operations company might be created to actually run the facility including the educational operations on behalf of the partners.

The occupants of a future Elmwood may be both private- and public-sector suppliers of FE. An objective would be to stimulate the market in post-secondary education provision in whatever shape that might be. There are already businesses in the NE Fife region which do this and there are examples of others elsewhere. LANTRA³⁵ provides an example of the kind of business structure which can be spawned into other sectors.

The project should also not be focussed not just on Elmwood because there may be other regionally-based suppliers who are capable of delivering FE in land-based studies and who could use SRUC and the regional colleges to provide accreditation. St Andrews Botanic Gardens is an example of a regionally-based organisation with big ambitions in this sector. Horticultural infrastructure at its site in St Andrews should be considered. Building the educational offer around existing and potential private educational business creates opportunity for linking with local businesses to provide educational opportunities and even direct sponsorship, especially for apprenticeships.

A suggested focus should be the *growth in green skills*. Quite apart from the traditional skills needed for the land-based economy, such as horticulture, agriculture and animal husbandry/care, this should embrace skills in the hydrogen economy and the energy supply chain which are all markets with significant skills shortages. However, NE Fife needs skills in many other non-land-based industries as well, such as hospitality and this should be on the agenda.

³⁵ <https://lantra.co.uk/>

A principle, which I have mentioned above, is that SRUC and other colleges should not be competing with other organisations to deliver these capabilities. SRUC may provide skilled teachers but they should be contracted to deliver to the needs of the operations company running FE education in NE Fife or to other suppliers. Their actions need to add value at a system level by stepping in when there are market failures for key educational services and by supporting other businesses to develop and flourish. This approach empowers education delivery from the community, by the community, within the community.

Positives include:

- A pro-active move to deal with a long-term problem.
- Flexible and adaptable, market-based delivery with focussed input of public funding to support public needs.
- Community involvement in governance and delivery.
- Places SRUC as a mentor and supporter for other businesses
- Ensures that SRUC's asset find future uses

Negatives/Risks include:

- The four players (SFC, Fife College, SRUC and Fife Council) may struggle to work together to build a business case.
- Despite an economic and ethical imperative, nothing happens.
- Drifting of objectives with time caused by poor governance skills and discipline.
- Making the business case add up might be challenging and it would need to be clear where the risk will lie.
- Local and national political backing for the project is essential.

Opportunity 2: Realising the potential of AI in rural and land-based industries

The purpose would be to greatly accelerate the creation of opportunities for implementation of AI to create more robust land-based businesses by increasing their competitive edge. This could include, for example, provision of market and forecasting intelligence to help decision-making. It would necessarily require the creation of a data hub to help create the training data to support AI models optimised for the land-based industries in Scotland. It would be a capability which provides information and advice on natural resource management possibly extending into the marine environment.

However, this vision for the use of AI needs to be more than just a service to help make better tactical decisions to improve the industry (which is largely how it is currently used). It needs to have a strategic purpose to shift the whole of Scotland's food production system into a mode which is ensuring that there is a better balance between bending to market forces and food security. This would be a food policy capability focused on changing how food itself, and benefits from food, flow through whole supply chains. As stated previously, little of Scotland's food production is used to feed people and this creates enormous inefficiencies as well as dependencies on unreliable actors which are potentially toxic.

There is a rapid pace of change driven by AI and it is essential that SRUC keeps up with developments but that it does this with a clear strategic purpose. For example, a recent competition run by Defra attracted about 50 companies participating, seven of which were

awarded a prize (<https://www.gov.uk/government/news/farm-tech-turbocharged-to-help-send-innovations-into-orbit>). SRUC should keep these developments under observation and potentially acquire capability through M&A. But SRUC also needs to ask hard questions about whether the resulting applications are likely genuinely to solve the big problems such as low productivity, equitable access to food and environmental degradation, or whether they simply dig the food system deeper into the mire it is already in. AI needs to be supervised in order to maximise its benefits.

This vision would most likely be constructed in three components. The first would be a small but globally-visible analytical capability which would be focussed on global food market intelligence and which would sustain a flow of this intelligence to a broad, international user base who would access through a pay-to-play model. Second would be a modelling and data collection component and, third, would be a user interface component which provides intelligence to policymakers, planners, growers, producers and retailers³⁶.

Although AI itself is capable of designing the user interface, it will need skilled supervision and there will be a need to initiate the design processes with appropriate seeding to ensure work flows are heading in the right policy direction. Other customers of for this capability are likely to be governments as they develop food security policy responses because it would be possible to design in policy preferences, including appropriate incentives, to the emerging advice.

It is likely that AI will find applications right across the land-based industries. The proposal is to create an AI engine but delivery of the capability could be achieved using SAC Consulting and the Scotland's Farm Advisory Service. SRUC in general is likely to be able also to exploit this for training and advanced research.

SRUC may not have the data or the skills to do this on its own so it would most likely establish this as a joint venture with other organisations with common interests and complementary skills.

Positives:

- SRUC has significant data resources.
- Drives up efficiency in an important socio-economic activity in Scotland.
- An opportunity for SRUC to show leadership in an emergent technology.
- The value proposition to practitioners should be easy to demonstrate.
- SRUC has a ready-made delivery process using SAC Consultancy.
- Would work synergistically with other opportunities detailed below.
- Lots of innovative companies in this field with whom to build partnerships.

Negatives:

- SRUC has little track record of working at the strategic policy level suggested here.
- AI represents such a transformational form of delivery that current clients and staff within SRUC may struggle to adapt – it will need new skills.

³⁶ An example of this kind of capability is the Nutrient Planning Tool for farmers recently released by Defra <https://www.gov.uk/government/news/farmer-productivity-boost-with-new-nutrient-planning-tool>

- Unlikely to need much of the current infrastructure at Elmwood (although this could be a positive).
- Will be seen as socially regressive because of the transformations it brings in terms of 'work' and the viability of some traditional forms of agriculture and employment.

Opportunity 3: Research Centre on Agricultural Robotics

The purpose will be to reduce the need for labour within Scottish horticulture and thereby to reduce costs, increase competitiveness and unlock the conditions for investment and growth in an intrinsically profitable agricultural sector. In the long term, this is likely to be most successful if it is built in partnership with a relevant, international engineering business which already has a track record in robotics, although not necessarily applied to agriculture.

The initial objective would involve a testing phase by scoping current technologies from around the world, acquiring test units and collecting data to help build the business case for supplying technology to local growers. This scope might eventually be expanded to modifying, designing and testing different robotic solutions suited to the kind of horticulture undertaken at scale.

In the long-term, this could lead to advanced manufacturing within the region of east Fife but, for SRUC, the immediate goal would be to establish the incentives needed to attract the skills and investment to seed this vision.

Positives include:

- No other known capability within Scotland.
- Local agricultural industry is likely to benefit and be a test-bed.
- High potential to be scaled for use within the UK and overseas.
- Builds on current technological advances in materials and AI.

Negatives/Risks include:

- Partnerships with engineering businesses are difficult to initiate.
- Lack of interest from local growers.
- Insufficient initial investment.
- Cost of robotic technologies could be too great for the scales of production currently in existence within Scotland.
- Trouble recruiting the right skills.

Opportunity 4: Design and Management of Land Use for Recreation

SRUC/Elmwood has a history of supporting education in golf course and estate management. Scotland also has an open access culture applying to the use of land for recreation but it is not always clear how those who manage land get credit for how others use their land. There may be an opportunity to combine these into a disciplinary field involving the design and management of land for recreational use.

Using golf as the starting point for tackling this more general problem of land use for recreation makes sense because (a) golf is a major international business with significant

presence in Scotland and especially in NE Fife, (b) major international consultancies operate in this field as part of the high-end leisure market, and (c) SRUC has a track record in this sector. The questions for SRUC is: how can it lever on the location and the track record of SRUC/Elmwood to develop an educational and research business which could add value to how international businesses work?

At its most mundane, SRUC could refresh and expand its role in practical aspects of on-the-ground golf course management. I heard from SRUC staff at Elmwood that there is opportunity in this area. SRUC already has an on-line degree, but it seems to me that it needs to accelerate its ambition to better exploit the market. This would inevitably mean developing its relationships with international consultancies and the golf course sector, including the various world golf ‘tours’ to understand their needs. This concept moves well beyond just providing education and training options for greenkeeping and turf management which is a crowded market, even in the UK. The value-added which SRUC should seek in this sector concerns moving up-market to exploit its co-location with the ‘home of golf’ and the access this would give to significant movers in the industry.

One area where SRUC’s other strengths could be used in order to boost the potential for success is in the provision of research and advice about environmentally sustainable practices in golf course management. This is a significant concern for the governing body of golf and many tournament manager but it is not a novel idea and some major players (especially in the United States) are already actively involved (Rutgers, 2025). Rather than compete, it would be sensible to find partnerships which can help deliver.

Positives:

- Building on current focus and capabilities at Elmwood.
- Local practical and economic interests.
- Potential to make a contribution to new developments in sustainability management.
- There is a lot of money in some sectors of golf, so there may be potential for philanthropic or even investment funding.

Negatives:

- Already a crowded and complex market.
- Uncertainty about whether golf has peaked as an economic or leisure activity, at least in the UK and possibly internationally.
- SRUC has run this kind of offering at Elmwood for a long time and it has struggled. What would be different this time?
- Would require significant external investment.

Opportunity 5: Food Commodity Manufacturing Innovation

This concept is about creating a breakthrough idea which could turn into an industrial giant³⁷.

³⁷ <https://www.ukri.org/publications/turning-breakthrough-ideas-into-the-uks-next-industry-giants/innovate-uk-turning-breakthrough-ideas-into-industry-giants/>

The world needs to change the way in which it supplies people with the nutrition they need. This is mainly because food production is responsible for much of the global GHG production, resource consumption and biodiversity loss. Moreover, food is produced with very low energy and material efficiency and this needs to change in order to solve the problems that food production creates. The good news is that the efficiencies are so poor that even small innovations could make a big difference and result in competitive advantage over current farm-based systems of food production. Unless we change the way we produce food there is little prospect of some of the most pressing problems, including global warming and the rise in pollution, being solved.

It needs to be emphasised that this is *not* a proposal to extend research into what is often called ‘vertical farming’ which can increase inefficiency in supply chains rather than reducing inefficiency.

Scotland has potential competitive advantage, mainly as a result of a future surplus of renewable energy, to help solve this problem and to lead the technology revolution needed to achieve change (see Appendix 11 for more information). Scotland’s advantage will also come from rapid declines in competitiveness in traditional agriculture in future³⁸ and the strategic need for Scotland to look elsewhere to both feed itself and to participate in global markets to generate external revenue.

The concept is outlined in more detail in Appendix 11. It aligns with a current trend to focus effort in science and innovation on economic growth by a collection of innovative concepts under the strategic moniker of “Engineering Biology” (SSAC, 2026). In this specific case, the need being addressed is for food production to be considered a manufacturing process driven by energy input which is used to chemically synthesise basic carbohydrates. These are then used either directly in pure form as commodity inputs (e.g. sucrose, glucose, fructose, starch) to food manufacturing or are used in secondary processes using synthetic chemistry, fermentation or other microbial or fungal systems to produce commodity proteins and oils. This builds on an already well developed manufacturing base for foods but replaces photosynthesis with other catalytic processes as the energy reducing system for food production.

Given the scale of the challenges, and the massive size of the ultimate prize, surprisingly little is currently being done globally to build this process. This is largely because there are considerable normative pressures on businesses and researcher to support current food production processes rather than to break out with fundamentally new innovations.

Research is needed to bring all the components together which are needed to make this work. Most of the essential elements of the process are known but research is needed to enable the process engineering which, when scaled, could produce outputs at price points which are

³⁸ The rationale for this has already been stated but it is built mainly on an inexorable process driven by a combination of market forces and climate. It involves (1) the increasing focus of food production in places which have the greatest competitive advantage; and (2) the geographical latitude of Scotland giving it relatively low incident solar energy, its relatively poor soils and its small scale as an agricultural producer.

competitive (and eventually undercut) those from traditional agriculturally-based systems of food production.

The proposal is for an ambitious, visionary and world-leading research facility in alternative food commodity manufacturing. This would require the construction of appropriate food technology infrastructure to enable experimental design in chemical engineering.

Positives:

- Even the establishment of a project like this – to solve one of the biggest problems facing people and the planet – would put SRUC on the international map.
- Even if practical success might be some distance down the road, just developing the IP will be a significant step forward and could generate significant returns for SRUC.
- Arguably, SRUC needs to break out of its shell of traditionality and do something which shows leadership in change management and this would fulfil this need.
- It is very likely to attract large investments of private funding because of the high-value nature of the end prize.
- This is the kind of initiative which is likely to attract grants from UKRI.

Negatives:

- The scale and ambition of a project like this may be too large and too risky for SRUC to take on.
- A project like this would be a significant departure for SRUC from its traditional approach to the land-based economy and may encounter culturally-based resistance both within SRUC itself and within the traditional farming community.
- SRUC would need new skills, probably acquired through partnerships with other institutions and businesses, and this would complicate delivery.

Opportunity 6 - Agricultural systems efficiency assessment

The human population of the world is probably feeding itself using fossil energy reserves. It is impossible for this to continue for much longer if disastrous consequences are to be avoided.

Agricultural systems globally operate at very low efficiency. Whatever measure is used – material efficiency, energetic efficiency, financial efficiency or nutrient efficiency – this is well recognised. More controversially, agricultural systems in Scotland might be classed as having low social efficiency because they do not create the social returns which are sufficient to attract new entrants to the industry and social mobility. **Opportunity 5** is designed as a way of transitioning away from traditional food production mechanisms as the main source of nutrition for people.

However, it needs to be recognised that food production from more traditional agricultural systems will always be needed in some form. The question is what can be done to improve their efficiency?

The field of life cycle assessment (LCA) has grown up to meet this challenge not just in agriculture but also in other industrial sectors. This is a useful tool which attempts to build a model of systems and to quantify inputs and outputs. It can then be used to compare the efficiency of different systems, such as different types of farming operations, or to suggest interventions which can be made to modify systems to improve efficiency. However, these assessments are dogged by two main uncertainties which affects how useful they are. The first is that they need data and about the food system which can be both difficult and complex to gather. The second is that the models are almost never validated.

There is a need for both data and validation at a range of nested scales including individual enterprise; catchment; and national scales. The nesting of scales is important in order to build from fine-scale to large scale to provide policy advice to practitioners responsible for managing at each scale but also to ensure appropriate stratified sampling is applied to ensure robustness of data at all scales.

Although SRUC has some capability on nutrient management and life cycle assessment (LCA), I am proposing something much bigger and more impactful because it needs to extend well beyond nutrient dynamics. It would involve the extensive instrumenting of the countryside and especially of waterways; the participation of farmers and Scottish Water to understand the locations and dynamics of inputs and output, and the construction of new stochastic models which can be fully validated.

Within NE Fife, there are currently some land managers who are experimenting with low-input agriculture within their own agricultural enterprises. They are, in effect, blind to the outcomes of what they are doing because they do not have access to appropriate measurement methods and modelling capability. They are attempting to find a sweet spot for low input farming which can still make money but they are completely unsupported in what they are doing and, on a national scale, no information is being made available to learn from their experiences. LCA at these local scales should be an important starting point for LCA at the whole catchment-, and the national-scale to build policy incentives to shift other farm business in the direction of greater efficiency with reduced environmental impact.

The fundamental problem being tackled in this opportunity is that nationally we have no reliable measurement of how efficient food production is and, therefore, how to intervene in terms of policy incentives to drive Scotland's food production system towards greater efficiency. If this problem was solved at a Scotland-level then it would have widespread application internationally because no other nation has a handle on this vital picture. For example, scientific literature on the number of calories of fossil fuel it takes to produce a calories of food is very sparse. Those that do exist sometimes suggest that there is an energy deficit. The world is probably sustaining current food production partly on solar energy from a couple of hundred million years ago and this is not something which is sustainable.

Positives:

- This addresses some major questions which can be solved at small scales (individual farms in NE Fife) and then applied at large scales (globally).
- It can form a foundation for policy advice and integrated with the AI opportunity.
- It creates a foundation for making judgements about the validity of claims about sustainability of different agricultural systems.

- It is fundamental enough to appeal to national funding agencies such as UKRI.
- Well aligned with what SRUC currently does.

Negatives:

- Getting basic data will always be a challenge, although some of the data will already be being collected for other uses.
- Although it might help individual land managers to settle on food production systems which are more efficient and environmentally sustainable, it is largely focussed on how to better design policy and incentives making it less interesting to private sector clients.

Analysis

8.6 Although considerably more detailed analyses would be required to determine which, if any, of these options is worth pursuing, a simple (and very rough) options analysis on these opportunities is presented in the following table. This options analysis is biased because many ideas which are less likely to be attractive, at least in my view, are not included. Given more time, the options analysis might include, for example, genetics and genomics (both crop and livestock) but this is already present within Scottish research institutions including SRUC. Forestry is another example and could lie within design and management of land for recreation, but forestry is also a focus in other institutions as well as SRUC. An area which could merit inclusion might be energy systems engineering aimed at reducing the reliance of land-based industries on fossil fuels.

8.7 The options analysis suggests that a leading contender concerns the assessment of agricultural systems efficiency followed by the application of AI, mainly because it is leading-edge, ambitious and there is likely to be current capability within SRUC which would support its development. Both of these could have a lot of synergy and AI also synergises with agricultural robotics.

Table: A simple options appraisal for the opportunities for growth in NE Fife. Scores of 1 (very low); 2 (low); 3 (moderate); 4 (high); and 5 (very high) are given in each case except for the 'risk' category where the scores are reversed. A 'red', 'amber' or 'green' rating is given in each case.

Opportunity	Description	Current alignment	Ambition/ distinctiveness	Scale of opportunity	Risks (low = 5; high = 1)	Impact	Immediacy of need	Ease of implementation	Overall
1	Green skills: education from the community, by the community, within the community	4	3	2	3	3	5	3	23
2	Realising the potential of AI in rural and land-based industries	4	3	4	4	3	4	4	26

3	Research Centre on Agricultural Robotics	2	4	4	2	4	4	3	23
4	Design and Management of Land Use for Recreation	4	1	3	4	3	3	4	22
5	Food Commodity Manufacturing Innovation	2	5	5	2	4	4	1	23
6	Agricultural systems efficiency assessment	4	5	4	4	4	4	4	29

Acknowledgments and declaration of interests

Acknowledgments

I wish to thank a large number of people who have helped immensely in the production of this study. This includes all those who have responded to my request for their views. It also includes the staff at SRUC including at Elmwood itself and among the senior management. Christine Milburn arranged for me to have access to a very broad range of documentation and Lisa MacDonald was very helpful at arranging my schedule of meetings.

Declaration of interests

I was not paid to produce this report and I did not claim expenses.

I declare that I have no direct interest in SRUC or its interests in NE Fife. While I live in NE Fife I have no interest, positive or negative, in the future of SRUC's investments in the region. My wife was once an employee at Elmwood College and was, for a very short time, an employee of SRUC but she transferred to Fife College when some of Elmwood's FE provision was moved to Fife College. She retired in 2019 and has had no further engagement with Elmwood, SRUC or Fife College since then. For transparency, my other current and recent engagements include:

Bishop Wardlaw Professor at the University of St Andrews

President, Royal Society of Biology

Co-chair with the First Minister of Scotland of the First Minister's Environment Council

Member of the Board of the National Oceanography Centre

Chair of Net Zero Advisory Group for Food and Drink Scotland

Chair and Member of various committees of the Royal Society:

Future of Land Use

Non-pharmaceutical interventions to manage pandemics

Science and policy

Member of various committees of the Royal Society of Edinburgh

Chair, Independent Advisory Board for Drax plc

Chair, Science Advisory Committee for Fera Science Limited

Chair, St Andrews Prize for the Environment

Recently terminated (in the last 2 years)

Chair, UK Research Integrity Office

Board member, UK Research and Innovation

Board member, Fera Science Limited

Board member, Hebridean Trust Limited

Appendix 1

Terms of Reference

The study shall focus on, but not be limited to the consideration of:

- Options for how SRUC might capitalise on and contribute to local strengths and in doing-so secure a sustainable future that is in tune with the innovation, skills and businesses of north east Fife and builds competitive advantage for the region.
- Opportunities in natural and land-based economies including, but not limited to horticulture, golf (tourism, soils and sustainability), and the wider food and health agendas such as 'Food for Fife'.
- Potential opportunities to secure additional funding and/or investment in growth of Elmwood including partnerships, philanthropy, City Deals/public funding and commercial opportunities.
- Explore options for effective and sustainable use of available space to support economic growth, job creation and related community benefits.

Appendix 2

Charitable objectives³⁹

SRUC has been established as a charity for the benefit of the public in Scotland and elsewhere, to advance education, science and environmental protection and improvement and in furtherance of these purposes the Institution will:

- (a) Equip, carry on, maintain and develop a college or school or schools having as its, or their, main objects the provision of tertiary education and in particular the teaching and study of, advice on and research into the Natural Economy and so improving knowledge, training and skill levels and encouraging entrepreneurial activity, and to provide appropriate business support, in Natural Economy-related opportunities across rural Scotland.
- (b) Expand research and education capacity in relation to the Natural Economy, developing stronger partnership working between all stakeholders including public bodies.
- (c) Support and encourage rural communities endowed with significant Natural Economy assets to develop sustainability and inclusivity based on those assets.
- (d) Encourage people and communities across Scotland to grasp the opportunities of the Natural Economy to deliver a green recovery based on high quality natural capital assets.

In these articles, the expression “Natural Economy” and cognate words, where the context permits, means ecosystem services being agriculture, fishing and aquaculture, food and drink, energy (including renewables), forestry, logging, and manufacture of wood and tourism and generally any and all associated sciences, technologies, crafts and skills, and all matters of whatever nature related to the use of land and water resources, health (including animal health and veterinary services), all aspects of economics and socio-economics, leisure, leisure activities and industries, wildlife habitats, conservation, climate change, natural capital, biodiversity and game management, the rural way of life and environment and the sustainable use of natural resources.

³⁹ <https://www.oscr.org.uk/about-charities/search-the-register/charity-details?number=SC003712#:~:text=Address%20Peter%20Wilson%20Building,on%20those%20assets;%20and%204.1.>

Appendix 3

Consultation responses

I am extremely grateful to all those who responded to my request for comments by either sending written responses or by agreeing to meet with me. I was inspired by the enthusiasm, passion and engagement of many individuals in the topic.

I obtained the views of a wide range of individuals and bodies. These are by no means exhaustive, but they include individuals from the local community, business and from education. To anybody who has been missed and feels they should have been consulted, I can only apologise.

I have copied below one consultation response in its entirety. This is “A Road Map for Elmwood” produced by Angela Andreson and Hilary Lumsden who have put a lot of useful thought and effort into solving the Elmwood problem. I recommend that this is considered alongside my own thoughts about how to move forward because it has a lot of merit.

A list of the responders is appended at the bottom of this appendix. These responses, as well as any direct discussions with stakeholders, were centred on three main questions which are given below together with a short summary of the kind of responses received. Rather than responding directly to the questions, a small number of responders wanted to re-write or re-organise the questions.

1.What would you see as being the future strategic role of SRUC’s Fife presence (delivered from its Elmwood campus) within (a) the local community; (b) SRUC; and (c) Scotland?

The responses were largely focussed on the role which SRUC could, or should, play within the local community of NE Fife and especially in relation to Cupar. The point was made that provision of FE in that region has been withdrawn and this presents considerable challenges for many young people.

The responsibility for this was mostly laid at the feet of SRUC and its management although there was some wider acknowledgement that structural issues concerned with FE provision in Scotland were involved. This included an acceptance from some that SRUC has experienced considerable financial constraints although the view was that, in general, this could be solved by better decision-making (especially allocating spending to Elmwood rather than to other locations), better management and a more innovative agenda.

While there were some individuals who thought that the buildings at Elmwood should be restored, most acknowledged that they were beyond useful life. A few suggested that the site should be closed and the capital should be used to invest in both new infrastructure and the ongoing operational costs (e.g. through a community-based trust). Several thought that the Eden Campus at Guardbridge would be a better place for a college and that the re-development of the Elmwood site in Cupar could be focussed on other community needs although these were not specified.

Many people thought that SRUC’s ambitions to provide end-to-end tertiary education were unrealistic (one called it “crazy”) and that SRUC would be most effective at delivering its own mission if it focussed on higher level education, while still acknowledging that it had a leadership

role to help address the urgent need for general FE provision locally and specialist FE provision nationally.

2. What are the top three subjects which SRUC should invest in within Northeast Fife, what are the challenges they would address and what outcomes would you envisage from those investments?

Those who saw SRUC as the supplier of FE provision at Elmwood generally wanted a return to the provision of vocational training in subjects including animal care, horticulture, forestry, gamekeeping, greenkeeping, golf course management. One responder saw a need for SRUC to deliver courses in “agriculture, farming, land management, rural business, environment, wildlife, aquaculture, hospitality, catering, tourism, and sport with a focus on golf”. Few of those who responded or whom I spoke with focussed on the research and higher education agenda although local agricultural businesses were split between SRUC supporting the provision of skills and training, and their role in furthering the technological capabilities of their businesses.

3. How should SRUC fund its future presence in Northeast Fife, in terms of (a) the capital investment needed to make its Elmwood campus into a first-class facility and (b) its operations at that campus and beyond.

Some responders chose not to answer this question but several of those who did respond suggested that the funding needed to come from the Scottish Government via various routes and initiatives. Many responders, especially from the local community, did not acknowledge the problems attached to asking for additional public spending to support any development at Elmwood. However, many saw the sale of assets as an important feature of any capital funding in future.

Those with more direct experience of government were blunt about the fact that SRUC could not expect more government support than it currently receives. Many of these individuals saw a need for much more imaginative business propositions. One respondent remarked, “I would see any life-injecting effort to be much more private sector driven, based on a narrow and specialised offering that fits in terms of financial outcome, economic, and place-based opportunities”, and “A successful setup would probably require it to move away from the current public sector structure into a private provider, so it can raise capital funding”.

Common misconceptions which were discounted within my analysis:

1. “The main building at the Elmwood Campus is fit to be re-opened and used by the community”. This is untrue. The building was known, based on surveys by competent professionals, to be in a poor state of repair even before it came into the ownership of SRUC and it has since deteriorated further.
2. “Student credits did not transfer to Fife College when elements of the curriculum were transferred out of Elmwood in the years following the creation of SRUC”. This is untrue. SRUC does not receive credits (and the funding which follows this from the SFC) for a large proportion of the FE provision which was once delivered from Elmwood.
3. “SRUC has sold assets at Elmwood which have then been used to fund the building of a new vet school at Craibstone in Aberdeenshire”. This is only partially true. Any receipts from sales would have been a relatively small part of the costs associated with building a vet school but it is probably true that investment in Elmwood has been de-prioritised resulting, inevitably, in decline.

4. “SRUC is obliged to take into account the views of stakeholders”. While this is desirable, SRUC is an independent charitable company and, based on its legal status, it should only do this if it considered that it was in the interests of the company to do so within its charitable objectives.
5. “SRUC has a public duty to provide FE education in NE Fife”. This is untrue. It is not contracted to do this by the SFC and, as a company, it only has a duty to adhere to its charitable objectives or specific contractual obligations and these do not mention any such duty.

Some other key points made:

“Sustain and Strengthen Core Place-Based Education”

Many stakeholders see practical land-based training as Elmwood’s heart and heritage (e.g., animal care, horticulture, rural skills, golf and greenkeeping). Focus on ensuring that the curriculum remains relevant to local employers, while adapting delivery for financial viability:

- a) Protect and modernise core vocational programmes like animal care and horticulture that are distinctive and tied to local employment pathways.
- b) Explore blended learning models that combine hands-on experience on site with remote and partnership delivery where appropriate.
- c) Reinforce pathways so students can progress to higher-level SRUC offerings (e.g., veterinary or environmental degrees), improving student retention and career outcomes.

“Invest in Strategic Partnerships”

Elmwood is positioned in a region with a growing population and educational demand (e.g., new housing developments in Cupar). SRUC could:

- a) Partner with local secondary schools (e.g., Bell Baxter) and further education providers to create shared programmes or feeder opportunities.
- b) Work with local employers (agriculture, horticulture, conservation, golf and leisure industries) to co-design courses that meet skills needs.
- c) Explore community education links, offering taster programmes, adult education tie-ins, and shared facilities to embed Elmwood in the local education ecosystem.

“Utilise Elmwood’s Facilities as Community and Industry Assets”

- a) There is local and national demand for vocational apprenticeships in land-based industries⁴⁰.
- b) Elmwood has facilities that go beyond traditional classrooms, such as an 18-hole golf course with professional teaching facilities, horticulture grounds, and flexible land-based labs:
- c) Expand the use of these features for continuing professional development (CPD), public engagement events, and industry workshops to generate income and visibility.

⁴⁰ One recent example of this is the development by the Forestry Commission of an apprenticeship scheme for forestry <https://www.gov.uk/government/news/new-routes-into-forestry-careers-as-apprenticeship-schemes-open>.

- d) Consider multi-use campus spaces that could host local events, farmer training, environmental activities, or start-up businesses in agricultural innovation.

A Road Map for Elmwood (by Angela Anderson and Hilary Lumsden)

There is a need for a road map for Elmwood for the next 5 years and beyond which focuses on the Fife community's priorities. In collaboration with the SRUC this should lead to a community action plan and a land use vision for Elmwood. The vision should focus on making Elmwood once again an excellent place to learn and acquire the skills which will lead on to employment. We would therefore like to explore with all relevant stakeholders, what a modern and sustainable educational provision at Elmwood could look like.

It will involve working in partnership with the local community, community groups, SRUC, Fife Council, NE Fife Area committee and the voluntary committees running our community spaces. Involvement should also be sought in the college rebuilding program in Scotland which is currently undergoing a major strategic overhaul, with a new **College Infrastructure Investment Plan (College IIP)** set for publication in autumn 2026. The initiative aims to modernize, decarbonize, and consolidate a diverse, aging estate of 24 colleges and 97 campuses, many of which date from the 1960s and 70s.

The College Infrastructure Strategy (CIS): The approach to delivering Scotland's College Infrastructure Plan highlights the Scottish Funding Council's (SFC) ambition for "a college estate that will provide a high quality, technologically advanced and sustainable learning environment enabling and enhancing successful learning and skills outcomes for students, staff, and communities".

Foundation Scotland also supports activities that enable young people to take part in education, with a particular focus on those facing barriers to education and programmes engaging young people in education or training around nature, horticulture, and conservation. As in the Glenkens district (Dumfries and Galloway), it is hoped that the Community Action Plan and Land Use Vision will prove invaluable over the next few years in getting regional and national organisations to take our priorities and ambitions seriously. (Glenkens and District Community Action Plan).

The recent report commissioned by the Glenkens and District Trust provides an interesting evidence base of the value of education and learning as the underpinning of sustainable rural communities. Hearing the voices of local people led to an emerging vision for education in the Glenkens: to create an educational hub at the heart of the community to deliver rural place-based learning from cradle to grave. The hub could become a centre of excellence for relevant rural skills, for example for the land-based and renewable energy sectors. (A Community-Driven Vision for Education and Learning in the Glenkens and rural Scotland)

The Glenkens Community Action Plan Steering Group has been strongly advocating for the rural voice to be heard at regional and national levels – working to alleviate some of the challenges our communities face at a systemic, upstream level, rather than just intervening to mitigate the symptoms. **We also wish the rural voice in Fife region to be heard.**

At a local level, the **Cupar Ward and Monimail Community Council Local Place Plan (LPP)** has already through its stakeholder meetings, consultations with young people and additional focus groups made considerable progress on this front. They noted that Cupar and North Fife are perceived to be relatively affluent and this perception has led to the area being overlooked for public

investment and does not reflect the nature of poverty locally. DWP figures quote a significantly higher proportion of children living in low-income families in Cupar and District compared to Fife and Scotland. The rates are almost double the national averages. Referrals to the Food Bank have risen.

The LPP also flagged up a number of other concerns including:

- the possible sale by SRUC of Cupar Muir Orchard, which is seen as a valuable asset. The **community did not wish to see the loss of the mature and productive orchard**. Opening up the site as a community growing space would allow a vital space for outdoor recreation and would foster health and wellbeing in the community. It was envisaged that this site might become a site for outdoor learning for local school children learning about ecology and food production.
- SRUC may in the future seek to sell/dispose of some of the campus grounds. The **residents have stated they do not wish this land to be used for housing**. The grounds are seen as a valuable local amenity walking and recreation and a valued green space. **The preferred community option is to retain the SRUC Elmwood site as an educational establishment where students can receive high quality in-person land-based training**. The allotments should also be protected as an amenity site for local people and thereby maintaining and improving the green nature networks in Cupar and protecting biodiversity locally.

It was noted that Agriculture remains a large part of the local economy and although the grain and livestock markets closed in the mid-1990s, there are still many local food producers such as Kettle Produce and Quaker Oats and many large arable, livestock and soft fruit farms in the area. However the LPP identified the urgent need to stimulate and encourage the local economy and a pressing need to connect the young people and those seeking work with local businesses. Their vision is for a vibrant, thriving, friendly and well-connected place.

Continuing provision of FE at the Elmwood campus would enable these young people to acquire the knowledge and skills needed to move more easily from education into work, thereby helping to stimulate the local economy.

As in Glenkens, a **Fife Community Action Group (CAG)** would enable a Community Driven Vision for Education and Learning to be created in Fife, with an Education Hub which would deliver place-based learning in this rural area. Along with a Land Use vision which would support outdoor learning for school pupils and provide an asset for outdoor growing and use as a recreational space.

Angela Anderson: Chair Elie & Earlsferry Community Council

Hilary Lumsden: ex SAC student

Save Elmwood

4 March 2026

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Group meetings were conducted with:

Staff at Elmwood College (about 15 staff in attendance)

Cupar community (about 70 in attendance at the Corn Exchange)

East of Scotland Growers Ltd

Individual meetings were conducted with:

Angela Anderson, Chair Elie & Earlsferry Community Council
Richard Armitage, Deputy Head of Education, Natural and Social Science, SRUC
Andrew Barnes, Head of the School of Natural and Social Sciences, SRUC
Pete Downes, Member of SRUC Board
Cupar Development Trust (representatives)
Kirstie Freeman, Fife Council
East of Scotland Growers (representatives)
Andrew Kirkness Chief Financial Officer, SRUC
Hilary Lumsden
Gavin MacGregor, Chief Operating Officer, SRUC
Christine Milburn, Director of Strategy Delivery & Growth SRUC
Jamie Newbold, Provost and Deputy Principal, SRUC
Andy Pedie, Member of SRUC Board
Bryan Poole
Wayne Powell, Principal and Chief Executive, SRUC
Willie Rennie MSP
Mark Ruskell MSP
Ester Ruskuc, Chief Operating Officer, University of St Andrews
Sustainable Cupar (representatives)
Paul Vaughan, Fife Council
Harry Watkins, St Andrews Botanic Gardens
Derek Watson, University of St Andrews, Eden Campus

Consultation responses were received from:

Angela Anderson
Simon Baldwin
Ian Butcher
Grizelda Cowan
Cupar Development Trust
Alex House
Michael Innes
Caryn Jack
Robert David Kirk
Margaret Kennedy, Councillor, Cupar and District Ward 20
Hilary Lumsden
Scottish Funding Council
Sustainable Cupar (sent by Sarah Davidson)
Additional informal discussions were had with various representatives of Scottish Higher Education.

List of documents received

I received a very large number of documents from SRUC itself, but the following are those sent to me by others from outside SRUC:

“Participation Request to SRUC – Elmwood College: Interim Report”

“Participation Request to SRUC – Elmwood College: Final Report”

“A Road Map for Elmwood”

“Notes from the Public Meeting, 26 February 2026 at Cupar Corn Exchange”

“Introductory talk” for Public Meeting, 26 February 2026 at Cupar Corn Exchange

“Note on social licence” for Public Meeting, 26 February 2026 at Cupar Corn Exchange

“Quotes” for Public Meeting, 26 February 2026 at Cupar Corn Exchange

“Higher & Further Education: additional funding and a change of approach are required”

“SHBT Unveils New 3-Year Strategy 22.01.26”

“The Scottish Government has made several proposals to refurbish old buildings, focusing on improving energy efficiency and addressing the skills crisis in traditional building practices. Here are some key initiatives:”

“Proposal to establish a short-term working group: Viability of Alternative Use Elmwood Campus Main Building, Residences and Grounds”

“A Future for Elmwood College?”

Letter from Wayne Powell to Davd Kirk, 28 November 2025

A vision document: “School of Natural and Social Sciences”

Letter from Hilary Lumsden to SRUC Chair, 19 June 2025.

Appendix 4

Number of students taught

Total number of students taught at Elmwood over the past four years together with the percentage taking courses in animal care which was discontinued in 2025/26.

	AY 22/23	AY 23/24	AY 24/25	AY25/26
Total FTE	285.2FTE	378 FTE	328 FTE	221 FTE
% Student in Animal Care	29.55%	42.85%	31.92%	N/A
On-Campus FTE	207 FTE	265 FTE	203.4 FTE	105.4 FTE
% On campus Student in Animal Care	40.72%	61.13%	51.47	N/A

Appendix 5

Number of courses delivered at Elmwood by level and delivery method.

SCQF Level	Campus Delivery (taught principally on Campus)	DL Delivery (taught online only)	WBL Delivery	Hybrid Delivery (taught mainly online but with some on campus activities)	Schools Delivery (this provision is taught both on campus and at the Schools)
4 (FE)	3				3
5 (FE)	3		4		
6 (FE)			2		
7	2	1		1	
8		1			
Totals	8	2	6	1	3
Training/Short Courses	4				

To note:

- Of the above, 4 of the 6 apprenticeships, the 2 distance learning programmes and the Hybrid programme are all unique to Elmwood and are taught nowhere else at SRUC.
- One of the Apprenticeships and the Hybrid programme are **new** in the last 2 years, and both are only offered out of Elmwood.

Appendix 6

Recent student cohorts by subject at Elmwood

Table: Student numbers on each course/programme for the last 4 academic years

SCQF Level	Course	Delivery	Students as FTE AY25/26	Students as FTE AY24/25	Students as FTE AY23/24	Students as FTE AY22/2
4	Introduction to Horticulture (Intro NC)	Campus	16	9	16	15
4	Introduction to Land-Based Studies (Certificate)	Campus	7	7	8	8
4	Rural Skills (NC)	Campus	15	8	11	5
5	NC in Gamekeeping	Campus	11	14	15	10
5	NC in Horticulture	Campus	17	27	20	10
5	NC in Countryside Management	Campus	9	9	10	15
7	HNC in Horticulture	Campus	16	16	18	12
7	HNC in Wildlife and Conservation Management	Campus	9.5	11.5	17	10
7	HNC in Golf Course Management (1FTE = 2 students)	Distance Learning	32.5	29.5	23.5	6.8* Note this was the sept intake, in this year we also had a January

						intake as well.
8	HND Golf Course Management	Distance Learning	4.5	4.5	1* this year there was a lot of late registrations.	5* also had a January intake.
7	PDA in Ecological Surveying (1FTE = 2 students)	Hybrid – mainly DL but with some on campus elements	17	15.8	Programme not run from Elmwood this AY	Programme not run from Elmwood this AY
5	SVQ in Food and Drink Operations (Production and Processing Skills)	Work Based Learning	3 students	7 students	1 Student 1 st year of programme	Programme not available this year
5	SVQ in Game and Wildlife Management	Work Based Learning	3 students	0	8 students	0 students
5	SVQ in Horticulture	Work Based Learning	0 students	5 students	12 students	11 students
5	SVQ Sports Turf Greenkeeping	Work Based Learning	29 students (this is for Sept entry, about the same will enter in April)	21 students (this is for Sept entry, about the same entered in April)	56 Students (This year we only had one entry in September)	49 Students (This year we only had one entry in September)
6	SVQ Sports Turf Greenkeeping	Work Based Learning	8 students (this is for Sept entry, about the same will enter in April).	5 students (this is for Sept entry, about the same will enter in April).enter in April).	17 students (this is for Sept entry, about the same will enter in April).	6 students (this is for Sept entry, about the same will enter in April).

6	SVQ Parks, Gardens and Green Spaces	Work Based Learning	0	0	0	0
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Notes:

- For the Golf HNC/D in AY 22/3 there were two intakes, one in September which is captured in the table above, and one in January, which is not represented. From AY23/24 we just registered students in September.
- For the Sports Turf Management Apprenticeship Elmwood moved to two intakes, one in September and one in April. The figures as noted above for this year and last reflect this, and so should be approximately doubled to get the total number of new apprentices.

Appendix 7

Capital allocation from SFC to SRUC

For context SRUC has:

- 347 Buildings (110 leased)
- · 113,000 m² GIA
- · 4,200 hectares
- · £71m estates backlog liability
- · Age Profile- significant proportion above 50 years

FE Institutions receive a capital funding allocation each year while HE organisations have traditionally had access to apply for Financial Transaction (FT) Loans to support capital works. In recent years FT Loans and capital funding for HE has been significantly reduced. Despite a significant FE component, the model/methodology put in place at the time of the merger of the colleges to form SRUC sees very little capital funding. In 2025/26 the FE component came to £173,356 and HE capital funding and below is a table of other FE institutions.

College/Region	Total capital maintenance funding FY 2024-25	Total capital maintenance funding FY 2025-26
(1)	£ (2)	£ (3)
Ayrshire College	1,100,906	1,155,049
Borders College	404,194	424,072
Dumfries & Galloway College	268,601	281,811
Dundee & Angus College	2,529,667	2,654,077
Edinburgh College	3,632,798	3,811,460
Fife College	2,469,503	2,590,954
Forth Valley College	739,525	775,895
City of Glasgow College	1,306,113	1,370,348
Glasgow Clyde College	2,967,847	3,113,807
Glasgow Kelvin College	1,074,219	1,127,049
Highlands & Islands Region	2,583,349	2,710,399
New College Lanarkshire	2,286,727	2,399,189
South Lanarkshire College	850,073	891,880
Newbattle Abbey College	87,981	92,308
North East Scotland College	3,487,078	3,658,574
Sabhal Mór Ostaig	337,250	353,836
SRUC	165,230	173,356
West College Scotland	3,819,662	4,007,514
West Lothian College	389,277	408,422
Total	30,500,000	32,000,000

The argument is that SRUC capital funding should be covered because it has access to other sources of funding that FE Colleges do not (FT Loans). These loans are typically granted subject to business cases and focus on either new facilities or significant upgrades rather than standard backlog maintenance (which is estimated to be over £70m for SRUC at present). HE capital funding to SRUC was £79k for the same period.

In the current year the maintenance and repair of the estate is estimated to cost £1.9m excluding utilities, building services, tax, equipment, and depreciation. With these included, but still excluding capital spend we are currently forecasting £10.2m expenditure. Capital expenditure itself is forecast at £4.9m and matched closely to capital receipts.

The SFC recently confirmed the FE college capital allocation model (done on a pro-rata basis)

- a. % share of the FE Credit volume target for the AY, and
- b. % share of high priority backlog maintenance from the 2017 SFC college estate condition survey.

In addition, since 2019-20 the totality of the FE capital maintenance funds has been split 58% backlog and 42% lifecycle or £18.560m backlog and £13.440m lifecycle for FY 25-26.

1. SRUC's FE Credit volume target share for FY 25-26 is c.1.297% and is used to calculate its share of lifecycle maintenance, which equates to c.£173,356 for FY 25-26, i.e. £13.440m x 1.297%.
2. SRUC's share of the 2017 backlog maintenance is 3.97%. However, in FY 2020-21 it was decided that SRUC's high priority backlog maintenance costs would be funded from HE capital. The SFC recollection is that this decision was made because as part of the capital spending review process for that year SFC put forward a case to government for additional capital funding for SRUC and was successful in securing considerably more (£3.5m) than SRUC would otherwise have received (c.£722k) for backlog maintenance that year; SRUC was allocated a similar amount in FY21-22.
3. The formula for the HE capital maintenance funds is similar to the FE capital maintenance formula in that it is allocated on a pro-rata basis but based on % share of the main teaching grant, which for SRUC is 1.582%, i.e. % share of £693.692m.

The table below provides a breakdown of the SRUC's FE and HE capital funding since FY2019-20. Had SRUC only received its 3.97% share of FE backlog for FYs 20-21 to 25-26, I estimate it would have received c.£4.26m in total over the six years, i.e. c.£710k pa, which is £2.74m less than it received.

Year	FE		HE		Total capital funding
	Lifecycle	Backlog	Lifecycle	Backlog	
2019-20	£118,000	£492,000	£264,000	£0	£874,000
2020-21	£178,000	£0	£264,000	£3,500,000	£3,942,000
2021-22	£158,000	£0	£258,409	£3,500,000	£3,916,409
2022-23	£169,022	£0	£259,000	£0	£428,022

2023-24	£169,022	£0	£60,000	£0	£229,022
2024-25	£165,230	£0	£78,855	£0	£244,085
2025-26	£173,356	£0	£79,134	£0	£252,490
Total	£1,130,630	£492,000	£1,263,398	£7,000,000	£9,886,028

Appendix 8

Building condition at Elmwood

In 2014 and 2017, the Scottish Funding Council (SFC), undertook national building condition surveys across the FE and HE estate in Scotland. This process categorises building condition backlog repairs through a risk matrix which is externally assessed by Chartered Surveyors using the four stage- Royal Institute of British Architects (RIBA) categories (see table below):-

RIBA condition matrix

Priority	Definition
A	Element as-new performing within its expected design life. No work except routine maintenance is required.
B	Sound, minor deterioration, slightly diminished life. No renewal required, any works of a general minor local repair and maintenance nature.
C	Requires major repair or partial replacement to bring it up to a "B" ranking standard, with a renewed design expectancy.
D	Elements failing; detrimental to surrounding elements. Partial or full replacement may be required. Items with high risk to Health & Safety.

Elmwood Campus condition repair summary

Category A- £207,090
Category B- £1,868,106
Category C- £9,706,147
Category D- £769,768

TOTAL- £12,551,111

This shows that over 83% of backlog maintenance was at category C/D, i.e. amber/red RIBA condition at Elmwood. This repair figure of £12.5m is likely to have significantly increased over post-pandemic period given construction inflation.

Even if the entire backlog was undertaken at this cost, it only provides a basic structural condition of structurally ‘wind & watertight’, i.e. it does nothing to modernise the student (pedagogic) experience comparable to a modern student facility.

The legacy structural condition and building fabric, e.g. single glazed aluminium windows means that the energy consumption and running costs at Elmwood is very high.

SRUC have had asbestos surveys undertaken at Elmwood campus through PCS Asbestos Consultants Ltd. This HSG24 asbestos survey inspection identified and/ or presumed nine (9) asbestos-containing materials (specified in detail within the report’s survey site map) and was undertaken as part of reinspection of known asbestos under the statutory ‘duty to manage’.

SRUC have had estate condition surveys undertaken through the national FE/HE work undertaken by SFC in both 2014 and in 2017. Both surveys concluded that the main campus building dating from 1972 was overall in poor condition. The 2017 survey states: “Constructed in circa 1972, the property is in poor condition, extensive repairs are required”. It goes on to conclude: “The main building at Cupar is its biggest liability and requires major investment to extend its life and bring its performance in line with modern buildings”.

Appendix 9

How could SRUC's mission be evolved?

SRUC could evolve to *champion, coordinate and support* the land-based economy of Scotland. This would largely address most of the constraints bearing down on SRUC. As a charity SRUC could:

- a) Support rather than compete with current educational and research capabilities within Scotland focussed on the land-based industries.
- b) Ensure, on behalf of the SFC, that educational opportunities at FE level are sufficient to supply the skills needed by Scotland's land-based industries using home-grown talent.
- c) Work with regional FE Colleges and universities to build accredited courses (from basic entry level to PhD, and including CPD and career progression) and that this is done to a standard which makes Scotland internationally competitive in land-based studies.
- d) Work to connect innovations and new technologies derived from other industrial sectors to support land-based industries.
- e) Create or source the private and public finance necessary for Scottish-based researchers to investigate break-out technologies.
- f) Work with the industry to help create the business structures which address the need for the co-design and co-development of new technologies to accelerate their adoption within the market.
- g) Work within the UK and internationally to build the reputation of the Scottish land-based sector but, in particular, to ensure it is represented when arguing for research funding with organisations like UKRI, the European Commission and third sector philanthropic foundations.
- h) Act as a non-aligned and financially independent adviser to government on food and environmental policy.

Appendix 10

Comparing counterfactual governance model for the NE Fife project

Model 1 – Traditional (or business-as-usual) model

This model calls for the continuing implementation of Elmwood as a component part of SRUC with equivalence to its other sites like Barony and Oatridge campuses which have specialist research and teaching offerings.

Elmwood would be tasked to expand its research and teaching offering in areas of current strength, including horticulture and golf course management and possibly to consider ways in which animal care could be restored. Considerable public capital funding support would probably be needed for re-development of the site, and I have already expressed doubt about public capital funding becoming available especially to support a 'more of the same' approach to development.

Governance would flow directly from the SRUC Board to the executive branch of SRUC which would be held accountable for further integrating Elmwood into the SRUC network.

Strengths:

- a) Familiarity and alignment with the current governance and operational design run by SRUC.
- b) May be filling a gap of educational need.
- c) Building on local economic profile.
- d) Would sustain Elmwood as a non-profit organisation bringing some tax advantages. There would also be the possibility of access to public sector grants.
- e) Ensures continuity within a model of the emerging SRUC structure and alignment with traditional university design.
- f) Likely to gain local support.

Weaknesses:

- a) Adds costs to the operation of SRUC without a clear potential source of income.
- b) Incentives to staff are weak because of inflexible pay and reward.
- c) Likely to rely on student funded places from Scottish Government which are not available.
- d) Past experience from operating Elmwood as a further education campus suggests it was not sustainable based on the likely level of funding, so what is new?
- e) Much work would be needed to understand the level of demand for educational offerings and whether they could be scaled to make them sustainable.
- f) It is hard to deliver growth through business partnership or merger & acquisition.
- g) Private capital financing is difficult because it is unclear how financial returns flow.

Opportunities:

- a) Building a well-integrated educational and research offering with local businesses.
- b) Making a contribution to local community and economic sustainability.
- c) Reversing the current trend towards greater centralisation of higher and further educational services.

Threats (risks):

- a) Low financial margin and recent deficit budgets in the University sector lower the confidence around the viability of adding more struggling infrastructure and diversity to the current system.
- b) Chronic under-funding mixed with high expectations of delivery and performance make for a difficult working environment for staff.
- c) Demand for services from local or regional businesses may not be backed up with financial or in-kind partnerships.
- d) Creating a credible business plan for Elmwood to attract public capital funding, and ongoing operational funding most probably through assisted student places, would be very challenging and may not be feasible.
- e) Unlikely to create the circumstances in which Elmwood could ‘break out’ of the mould of a local or regional supplier of educational and research services to become nationally (UK) and internationally competitive.

Model 2 – succeed fast/fail fast model

The purpose behind the alternative *fail fast* model is to offer a departure from how universities operate as quassa public sector institutions. Expansion of the public sector in Scotland is arguably an unrealistic prospect in the foreseeable future. This model is, therefore, designed to exploit private sector finance, innate skills and entrepreneurial potential in the region, and regional and national demand for services. It is called “succeed fast/fail fast” because it is meant to find solutions which work and dispose quickly of ideas which do not work. It should employ a process of selection involving business cases which would then live or die on their capacity to raise appropriate finance and to make them work financially. SRUC’s contribution would be to create and nurture the business environment, support strategic linkage between businesses and to be an investment partner.

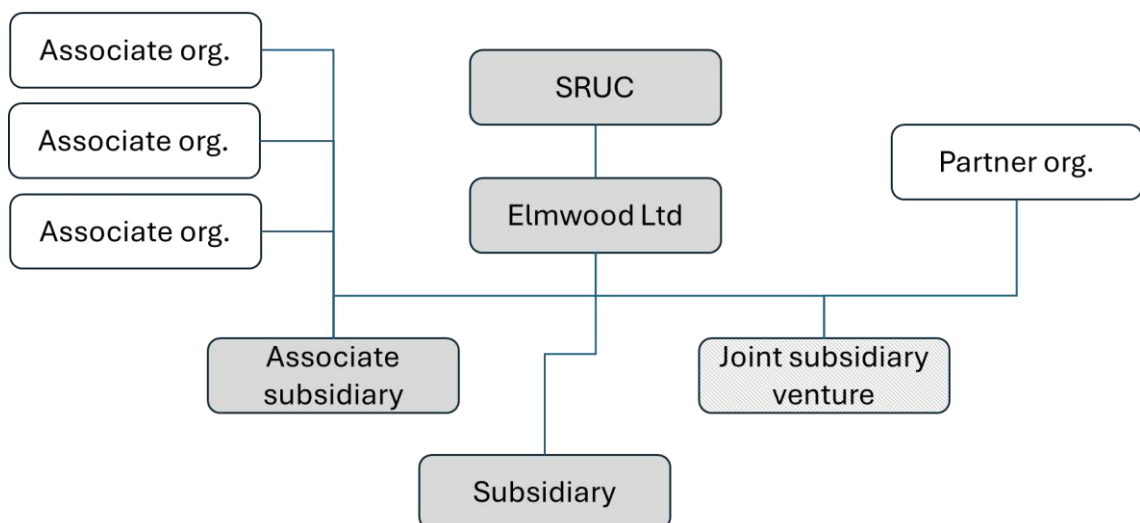
The business design involves the following:

- a) SRUC establishing a wholly-owned business. For the want of a better name I shall call this “Elmwood Ltd”. The purpose of this business should be to develop Elmwood as an innovation-led campus.
- b) SRUC could, if it wished, capitalise this business with an initial transfer of Elmwood assets into Elmwood Ltd or, alternatively, place those assets at the disposal of Elmwood Ltd through a long-term lease.
- c) Elmwood Ltd would have an independent chair and board but, as the shareholder, SRUC would have a representative on the board. This representative’s role would be to ensure that Elmwood Ltd operated to the objectives and standards set by the SRUC Board. SRUC would need to approve the appointment of Chair and Board members and would have the capacity to dissolve the Board should it wish.
- d) As a general guide, Elmwood Ltd would seek to raise capital to pursue ‘projects’ examples of which are given below as ‘options’ for future development. These projects could be constituted in a number of different ways but would, as a general rule, operate as independent subsidiary businesses in which Elmwood Ltd would have varying levels of financial interest and exposure. Business types could include:
 - Wholly-owned subsidiary operations.

- Joint ventures where Elmwood Ltd establishes a separate business as a company limited by share with a partner organisation to deliver a specific objective.
 - Company(s) limited by guarantee and established by Elmwood Ltd where partners (e.g. other businesses that take services from the subsidiary) can gain preferential access to those services at reduced cost in exchange for membership of an association.
- e) In each case, Elmwood Ltd would have three critical roles: (1) the provision of strategic leadership and vision in order to build strength and resilience in a network of businesses pursuing broad similar innovations but within different markets; (2) maintaining the communications with government and other public sector operators like Scottish Enterprise and the Scottish National Development Bank, and (3) the provision of business systems support and accommodation, at least within the early phases of development of those companies. An early question to be addressed in the design of Elmwood Ltd would be whether it would provide those services and accommodation to business in which it had no financial and strategic stake.

The accompanying organisational chart (Fig. 1) helps to show this design. An imaginary case study is as follows: If there is a need to provide CPD to industry on matters of technology development, health & safety, legal and other aspects of business operations, a company might be established to deliver this. It could, for example, be called Elmwood Education Ltd. It would be wholly or part-owned by SRUC and would be tasked to deliver courses in specific fields. Elmwood Ltd could grow this organically from inception by leveraging off the SRUC brand but it could also seek to acquire an already existing and established education provider which operates in a broad congruent area of business, thus growing through merger or acquisition.

Figure 1. Organisational chart for the potential business structure operated by SRUC at Elmwood. Shaded components indicate those where SRUC would have a financial interest.



Strengths:

- a) Flexible structure which bends to market demand and emerging opportunities.
- b) Many options for incentivising and rewarding participants including employee share ownership.
- c) Low financial risk to SRUC because risk mitigation is already built into the model.
- d) High capacity for innovation and for rapid, step-out growth in emerging research and teaching markets.
- e) Opportunities for growth come from standard processes of merger and acquisition.
- f) Operation of standard business systems and structures allow the docking of appropriately mutualistic businesses in partnerships – other business know what to expect.
- g) Raising private capital is feasible and there is a clear pathway for financial returns on investments.
- h) Possibility to exploit public sector loans and stimulus packages.

Weaknesses:

- a) Complexity of implementation and processes needs substantial business skills which may not be available.
- b) Raising and sustaining private finance may prove to be difficult, especially at the early stages before a track record is established.

Opportunities:

- a) Use the degree-awarding powers of SRUC to stimulate course development and delivery by third-party providers in partnership with SRUC.
- b) Unlocking entrepreneurial potential, mainly regionally.
- c) Building businesses which operate locally to grow.
- d) Stimulating growth in the local economy of Cupar.
- e) Depending on the innovations adopted, making a fundamental contribution to the prosperity of the region and Scotland in general.
- f) To generate revenues for SRUC to maintain its operations at Elmwood but also to potentially generate capital returns for re-investment on new projects.
- g) Exploiting local and regional competitive advantages, such as those which arise from soils, climate, renewable energy and extant industries.

Threats (risks):

- a) The inevitable failure of different business components will carry reputational risk for SRUC.
- b) Too few people see this as an opportunity to develop their ideas resulting in an imbalance between top-down and bottom-up generation of business opportunities.
- c) SRUC makes insufficient initial investment on people, infrastructure and business development to reach the activation energy required for self-sustaining growth.

Appendix 11

Meeting the food and environmental challenge of the future – a Scotland perspective

The challenge

The next few decades present many challenges for humankind but one of the greatest of these is to find a way of supplying sufficient, healthy food to people while not degrading the environment to the extent that human health and welfare also become degraded (Godfray et al., 2010a). This is a trade-off between benefits and costs within the current food supply system (Godfray, 2014).

Current indicators involving: biodiversity loss (Godfray, 2011); reductions in soil nutrients (Lal, 2009); aquatic eutrophication (Tilman, 1999); unresolvable emissions of greenhouse gases (Ivanovich et al., 2023); declines in innovative ways of increasing food yield (Ray et al., 2013); and the increasing frequency and impact of non-communicable disease caused at least in part by poor diets (Springmann et al., 2016, Clark et al., 2019), point to a food system which is under stress. Expressed in terms of system dynamics, the food system is a long way from an equilibrium state (Gaupp et al., 2020). In an equilibrium system, inputs in the form of materials and energy would be broadly sustainable through time. Recent suggestions of trade-wars point to a risk of collapse in the rules-based trading system which have largely been responsible for sustaining the rise of global food productivity over about the past 30 years. This should be concerning because food system failure would result in mass starvation and collapse of current political and economic norms.

Scotland is vulnerable to these effects partly because it is intimately linked into the global food system and because its “food” supply capabilities are, in general, not deployed to supply food at all. For example, according to Scottish Government figures, Scotland imports about 46% of the food it consumes (including vegetables and important commodities like wheat flour) and only 21% of calories produced in Scotland are for human consumption. Most of the calories produced in Scotland are used to make alcohol or are fed to livestock. Even if livestock are eventually used for food, use of food in this way can incur up to a 90% loss of food chain efficiency⁴¹, thus exacerbating reliance on imported food. This implies that not only does Scotland export a large amount of its food production, the environmental impacts of food consumption by Scottish people has much of its impacts beyond its borders. Overall, Scotland uses relatively little of its suitable agricultural land to grow food which supports people.

The situation in Scotland has arisen because market processes drive economic rather than energy or nutritional efficiencies and are largely insensitive to strategic issues of food security. The food system is geared to making money rather than feed people or the need create resilient supply chains. Both of the latter considerations can only be dealt with by policy intervention.

Policy and technology interventions

Two general policy approaches are usually considered to deal with these kinds of problems (Springmann et al., 2018). The most popular involves reform of the food production system. This can emphasise, for example: a more directed food policy involving better assignment of land to various functional uses, one of which is food production; reducing food support subsidies (mainly delivered through support payments to farmers and tax breaks on fuel); or incentivising production

⁴¹ Food chain efficiency is defined here as the percentage of energy and materials within food which could have been grown or allocated for the purpose of feeding people, is lost as a result of reallocation for other purposes.

of specific kinds of foods like fruit and vegetables. However, experience of national-level policies towards food production have shown that they can introduce many negatives such as over- and under-production. In addition, it is very difficult for a small producer nation like Scotland to act on its own when its food economy is intimately linked to the global food economy. Even when policy is enacted at the level of the EU, food production policy has been enormously difficult to shift and many attempts have resulted in ignominious failure, exemplified by “butter mountains” or “milk lakes” and the general failure of environmental measures within the Common Agricultural Policy to reverse, or even to stop, declines in biodiversity.

The second general approach has been to invest in research and technology development, in the hope that innovation can resolve the problem. Sometimes this is called sustainable intensification (Tilman, 1999), but there is a lot of evidence that the returns on investments in agricultural research are nowhere near sufficient to address the rising yield gap (Ray et al., 2013) let alone the need to reduce the creeping, incremental use and degradation of land to support food production.

The role of politics

Meeting the challenges of food production has, therefore, proved to be problematic both for policy and technical innovation. Failed attempts at reform of the EU Common Agricultural Policy have demonstrated that there are very strong forces which tend to stabilise the food production system in its current form and which work to prevent reform. These happen largely because agricultural policy is a mixture of economic, environmental and social policy but where social policy designed to keep farmers on the land (especially involving incentivising farmers to sustain outdated modes of production) gets the lion’s share of political attention. Both economic and environmental objectives for farming are consistently subdued because of the dominance of the political leverage held by farmers. In the language of system science, there are very strong stabilising feedbacks which defeat even the most determined reform agendas.

Current constraints

In these circumstances, what are the options available to satisfy the need for increased food production and to achieve this in ways which would alleviate further environmental degradation and to achieve this in ways which are politically feasible by keeping farmers happy? For all the reasons given above, reform of the current system of food production by agriculture is unlikely. However, in addition, food production by farming cannot be scaled up, except by using more land or by producing from the current land at impossibly high (and likely environmentally damaging) intensities of production. Farming is also constrained technologically by inherent inefficiencies associated with fertilizer production⁴², the stochastic effects of weather and disease⁴³, livestock production inefficiency⁴⁴ and the low underlying energy assimilation efficiency of photosynthesis⁴⁵. The high latitude of Scotland in particular also reduces incident radiation which limits production.

Transforming food production

⁴² Fertilizer production uses about 2% of global energy production and 1.4-5% of global greenhouse gas production

⁴³ The effects of extreme weather are forecast to create greater challenges for conventional agriculture. Both climate change and global trade (because to the disease it tends to transport) are also forecast to increase challenges from disease.

⁴⁴ See note a

⁴⁵ When operating optimally, plants normally convert only 3-6% of the sunlight they are exposed to into energy. This compares with more the 20% for contemporary photovoltaic cells used on domestic roofs.

In broad terms, solving this conundrum over the coming decades will only happen by increasing food production using the principles of manufacturing rather than those of farming. This requires a technology transition using a combination of chemistry, process engineering, robotics and genetics.

The key to unlocking the translation of raw energy and chemical inputs to edible outputs, is to split CO₂ to create formaldehyde, methane or glycerol (a refined version of the Formose Reaction (Lambert et al., 2010) which is currently at 'Technology Readiness Level' TRL 3-4)⁴⁶ as intermediates to produce carbohydrates like glucose, maltose, galactose, fructose, sucrose and starch (Dinger and Platt, 2020, Lambert et al., 2010). These can either be used directly to formulate foods or fed into biogenic reactors to produce proteins and oils which can then be used in food formulation (currently at TRL 8-9) (Clark et al., 2012). Most of our knowledge about these processes involving the chemical synthesis of food from CO₂ derive from research to support space missions (Martinez et al., 2021) but they are also recognised as having potential to be scaled to create food production systems on Earth and which have greater efficiency than current food production systems (Dinger and Platt, 2020, O'Brien et al., 2022).

At the core of this is energy to split CO₂. Solar or other renewable energy (possibly including Small Modular Nuclear Reactors) would be needed as the basic input but would have the potential to make food with negative GHG emissions. Using CO₂ from flue gases used to burn biomass for heat production would add further to the advantages of such a process. The chemical outputs could be used as feedstock for current micro- and macro-biological systems of food production. The eventual aim would be to produce carbohydrates at megaton scales.

This kind of manufacturing could make a significant step towards decoupling human food production from resource consumption. Agriculture is 2-5 times less resource efficient than the next-least efficient industrial sector meaning there is vast scope for transformation. There are many reasons for this low efficiency (some mentioned above) but reducing these requires out-of-the-box thinking and action. For example, photosynthesis produces carbohydrate at about 1% efficiency; energy harvesting by photovoltaics (or from wind power in Scotland) could produce carbohydrate with an efficiency of >6% (O'Brien et al., 2022, Dinger and Platt, 2020, De Luna et al., 2019). Analysis for space missions shows that this non-biological route to carbohydrate production, if appropriately optimized and scaled, and if connected to sources of renewable energy, is the most promising route by which to achieve human sustainability (Martinez et al., 2021).

Optimization and systematization are needed to make this kind of production system price-competitive with traditional agriculture but the greater predictability and lower costs (little net fertilizer use, no pesticides) will help.

Scotland is well-placed to be a leader in this field because it has abundant renewable energy, abundant freshwater, high quality research, a substantial chemical industry and a local need to reform its approach to food production in order to enhance food security, reduce damage to the environment and meeting its greenhouse gas reduction targets.

⁴⁶ Technology Readiness Levels are used to assess the progress in a technology towards full scale use. It is on a scale of 1-9, where 1 is a new insight or invention and 9 is a fully commercialised product.

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