

# **A Review of Coherent Provision and Sustainability in Further and Higher Education: Call for Evidence**

## **Response from The James Hutton Institute**

### **a) What do you think works well in the current further and higher education arrangements that we should keep in order to secure Scotland's inclusive social and economic recovery from the current pandemic? How can we best preserve and strengthen those features of education, research and innovation in Scotland that we most prize, in a very challenging funding environment?**

As recent SFC reviews have shown, Scotland performs well in science and our universities, colleges and specialist institutes all play an important role in ensuring this is the case. The recent COVID 19 pandemic has highlighted the importance of the Scottish science "ecosystem" and, in particular, the flow of the research data, resources and ideas between specialist research institutes, universities, public and private sectors, as well as civic society. It has also shown the importance of maintaining underpinning research infrastructure and long-term research programmes as a part of our National Capability in order to understand and respond to unexpected challenges and to be as prepared as possible.

If a green and inclusive recovery is to be realised, we will depend very much on our maintaining and enhancing our Natural Capital and ensuring that whatever we do is aligned with responding to the climate and biodiversity crises we face. Our specialist expertise and underpinning capacity in research relating to the environment and land use complements that elsewhere in the Scottish science ecosystem and will be critical in ensuring that the Scottish Government achieves its aim of a green recovery.

Research gives excellent returns on income (e.g. the James Hutton Institute's ROI has been estimated at £12.75 for every £1 of Scottish Government funding) and is also very successful in levering inward investment from UK and EU funding sources. It follows that there is a case for increasing research funding, even though finances are challenging. This is the approach the UK and European governments are taking, and there is a danger Scottish science will fall behind if we do not do the same.

However, efficiencies and better working together are also possible. The creation of Innovation Centres and new ways of working across and between HEI/FE/specialised institutes and the public-private sectors could help achieve even better outcomes. We need to ensure there are no structural barriers to effective working.

Innovation Centres focused on particular technological frontiers (e.g. sensors) or specific sectors (AgriTech) are showing a lot of promise. The SFC Innovation Centres have been joined by UK funded AgriTech Innovation Centres and, in our case, two new Innovation Centres funded through the Tay City Deal: The International Barley Hub, and the Advanced Plant Growth Centre. There is a need to think how these Innovation Centre families can best complement each other and how to maximize the lateral flow of ideas and opportunities between them. The SFC could play a key role in this and thus delivering the Green Recovery.

There are other ways of ensuring synergy within the Scottish science ecosystem. The James Hutton Institute has 12 joint University appointments and hosts the University of Dundee's Plant Science department on our Invergowrie Campus. The latter is seen as a model of HE/Institute

working which sees fundamental science linked through to applied outcomes. The model is in fact now being replicated elsewhere e.g. Cambridge Crop Centre. Finally, and in a different model and focus, the SG funded Centers of Expertise in climate change, waters, plant health and animal health see specialised institutions working effectively with HEIs on short delivery objectives for policy and industry.

We believe there is scope to do more of this type of collaboration in other science discipline areas. New initiatives for example on Pooling would also be welcome if they were extended to include specialised institutions.

Each year the Institute hosts a large number of visiting scientists from other Scottish, UK and international Institutions and we have a vibrant PhD school of over 120 students registered at over 30 different Universities. A partnership with St Andrews realises an equitable share of the income from PhD students at the James Hutton Institute and we would like to see this model extended to other universities. There may be further benefits to be accrued by including specialist Research Institutes in other levels of education, training and learning that exploits Scotland's reputation for excellence and relevance in science.

**b) What do you think colleges, universities and specialist institutions should stop doing, or do differently, in order to contribute effectively to an inclusive social and economic recovery? (You may wish to comment on teaching and skills development, sectoral and employer needs and employability, research, innovation and knowledge exchange, widening access and equalities issues.)**

To deliver an inclusive social and economic recovery, research needs to be done differently. Given the urgency of the climate and biodiversity crisis, more action-based and interdisciplinary approaches are needed so that research is better connected to the needs of end users. HEIs still predominantly support discipline learning (Boone et al., 2020) but we also need more training in inter-disciplinary approaches. Interdisciplinary (and transdisciplinary) working can, in part, be supported through Innovation Centres. The Institute has won £62m funding as part of the Tay Cities Deal to deliver two projects which will meet this requirement: the Advanced Plant Growth Centre and the International Barley Hub. Similarly, its action-based project at its Glensaugh research farm is not only demonstrating a new climate positive approach to farming but also new means of co-financing initiatives, as suggested by Vivid Economics and Environmental Finance (2018).

COVID19 has highlighted the necessity of an Open Science approach and we must ensure society trusts the science and that risks and benefits are open and transparent. The James Hutton Institute does not receive bespoke funding for the costs of supporting open access publications, data, sampling and modelling resources or for supporting active knowledge engagement across sectors and society. This constrains for example our interactions with Scotland's science centers and the general public.

Finally, in relation to inclusion we need to stop doing those things that sustain the unacceptable status quo. The Black Lives Matter campaign has highlighted the significant underrepresentation of black people within higher education and research. Similarly, women remain underrepresented, particularly at senior levels in many discipline areas but particularly STEM subjects. We feel that more could be done within Scottish educational and research establishments to identify and address the structures and cultural biases which perpetuate this situation.

**c) How can colleges, universities and specialist institutions best support Scotland's international connectedness and competitiveness in the post-pandemic, post-EU membership environment?**

International research funding has been vital in ensuring Scotland's science base is academically excellent and internationally relevant. The James Hutton Institute is in the top 8 UK Institutions for success in securing EU funding in our sector including success in the highly competitive ERC grants. Beyond Europe, the Institute has significant research ongoing in India (through amongst other means the [Hydronation International](#) initiative), Sub-Saharan Africa (supported by, amongst other sources, GCRF funding), and China (via Newton funding). Many of these international projects are in collaboration with Scottish Universities.

We strongly urge the SFC to lobby to protect international research funding streams including all elements of Horizon Europe. We would also value increased research funding opportunities with North America where there are relatively few opportunities at present and we need more cooperative funding opportunities if we are to build trade there.

An area of potential improvement would be to increase awareness between Scottish Institutions of work ongoing in particular countries so as to ensure value added as opposed to overlap in effort. For example, even in specific countries such as Malawi where there is concentrated focus for Scottish institutions, there is often low awareness of what each of us are doing. More awareness and coordination could lever more overall impact. Finally, the Institute would welcome the opportunity to be invited to support HEI or SFC-organised international missions and activities to add value where possible.

**d) What opportunities and threats does the post-pandemic environment hold for colleges, universities and specialist institutions? For institutional leaders, how are you planning to address these challenges and opportunities?**

The James Hutton Institute specialises on research relevant to the environment, agriculture and food sectors and, more generally, the resilience of the rural economy. These sectors have the potential to play a key role in Scotland's green recovery and will be critical in addressing the climate emergency and biodiversity crisis. This will require, however, bold actions and interventions, guided by high quality scientific evidence, and new technical, social and institutional innovations.

Key threats in the post pandemic environment are a reduction in research and innovation funding and barriers to international collaborations due to a global shift towards protectionism. Infrastructure funding and investment in world class facilities is needed to retain the best scientific talent in Scotland. One way in which the James Hutton Institute plans to address these challenges is through the development of "Open Science and Innovation Campuses", building upon investments through the City and Region Growth Deals. The James Hutton Institute has led two successful infra-structure bids totalling £62m for the International Barley Hub, and Advanced Plant Growth Centre in the Tayside Region. More funding is needed to complete the campus at Invergowrie, Dundee and upgrade the site at Craigiebuckler, Aberdeen. Both sites are attracting private and public organisations to co-locate with the Institute, and to build collaborative approaches that take advantage of resources and expertise that are unique in Scotland.

Remote learning and working opens up new opportunities for new collaborative educational and research opportunities between Institutions that are competitive in global markets . Finally, shared work locations across multiple institutions might also make savings and result in more effective collaboration.

**e) What forms of collaboration within the tertiary education eco-system would best enable a coherent and effective response to these challenges and opportunities?**

As described above, we believe there are various ways through which multi-institutional innovation centres, partnership and centres of expertise could better meet the challenges and opportunities that are faced. We strongly support the recommendation of the Heathwaite review (SFC, 2019) that science and research Institutes beyond the sectors supported by SFC are included in future Scottish research pooling initiatives. Better facilitating the partnership and participation of the James Hutton Institute and other members of SEFARI in these initiatives should strengthen the Scottish research response to future challenges.

In addition, we would be keen to see greater use of our research platforms and the long term scientific resources (collections and datasets) that we steward on behalf of the Scottish Government as we feel these have significant value within tertiary education.

**f) How can SFC, alongside government and other enterprise, skills and education-focused agencies, best support colleges, universities and specialist institutions to make their full contribution to Scotland's inclusive, green and education-led recovery?**

We have covered much of this in foregoing points, but to re-emphasize:

- While recognising financial realities, we continue to believe that the best way to support the post pandemic economy would be to further invest in research and development. This is the approach being taken elsewhere. Not following this approach may therefore threaten Scotland's scientific standing as well as it's ability to deliver an inclusive green recovery.
- To support Institutional agility, future research funding needs to be flexible and focussed on maintaining underpinning capacity. In this way Institutions would be best placed to respond to the changing environment and needs of industry and policy and internationally competitive.
- To avoid institutional competition and maximise synergies, funding needs to be directed at cooperative opportunities and multi-brand offerings.
- Within future funding allocations, it is essential that the costs of supporting open access publications, data, sampling and modelling resources and active knowledge engagement across sectors and society are recognised.

**References:**

Boone, C.G., Pickett, S.T.A., Bammer, G. et al. Preparing interdisciplinary leadership for a sustainable future. *Sustain Sci* (2020). <https://doi.org/10.1007/s11625-020-00823-9>

SFC (2019) Independent Review of the Scottish Funding Council's Research Pooling Initiative. Chaired by Professor Louise Heathwaite <http://www.sfc.ac.uk/research/research-pooling/research-pooling-review.aspx>

Vivid Economics and Environmental Finance, 2018. Natural capital finance model – Strategic Outline Case, report prepared for Defra, pp65.