Exploring the concept of a centre of innovation excellence for Scottish aquaculture

An independent scoping study conducted by Alan Sutherland on behalf of the Scottish Aquaculture Innovation Centre

December 2016
“I had no idea what to expect in terms of industry interest or support for a centre of excellence for Scottish aquaculture. However, the resulting feedback was even more positive than anticipated – as was the level of interest in, and offers of support towards, the concept.”
Executive summary

For the Scottish aquaculture industry to evolve and grow, it requires the right infrastructure, prompting the Scottish Aquaculture Innovation Centre (SAIC) to canvass industry opinion on the concept of a centre of innovation excellence: whether there is a need for it, who should lead it, what form it might take and how it would be funded.

The resulting study, conducted by independent consultant and respected industry figure Alan Sutherland, collected data from 101 industry stakeholders, ranging from senior management and academics specialising in aquaculture-related fields, to representatives from government agencies, industry bodies and non-governmental organisations (NGOs).

Key findings

From this, five key findings emerged:

1. The sector is strongly in favour of establishing a centre of excellence with 84% of respondents agreeing that it would be of real and practical benefit to Scottish aquaculture and only 1% disagreeing.

2. Appropriate capital investments should be made in support of existing facilities first and foremost, supported where appropriate by new infrastructure to address any identified gaps in provision.

3. Provision of facilities – existing and new – should be coordinated by a single entity. The majority of representatives were of the opinion that existing organisations could fulfil this role, as opposed to another new organisation being formed.

4. There is a clear preference for the centre of excellence to be led by a consortium with strong industry representation. While respondents saw academia as having an integral role to play in the work of the centre itself, there was little support for an academic-led entity.

5. Initially, this centre of excellence would require public sector pump-prime funding. Over time however, it should become commercially self-sustaining.

Recommendations

Given the findings of this scoping study – in particular, the clear support for a centre of innovation excellence – it is important to explore the concept further.

The following report concludes with a series of recommendations and priority actions for how to do exactly that. These include:

- Establishing the nodes in an organisational infrastructure
- Agreeing a leadership structure
- Setting out a clear remit
- Identifying funding models
- Clarifying the working title for the concept.

There is a clear preference for the centre of excellence to be led by a consortium with strong industry representation.
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Introduction
1. Introduction

1.1 Background to the report

The idea of having a dedicated centre of innovation excellence for Scottish aquaculture first came to SAIC’s attention back in 2014, during initial engagement with the industry.

Over the subsequent months and years, through informal discussion with partners, SAIC has sought to explore the idea further by asking two key questions:

- **One, is such a centre both wanted by industry and warranted?**
  - Are there critical gaps in the current R&D infrastructure? Would having a dedicated centre of excellence help address these? Would it support problem-solving innovation and, in doing so, accelerate the growth and profitability of the sector?

- **Two, what form would it take?**
  - Would it be one physical centre of excellence or a network of complementary facilities? Would it involve all-new facilities, make best use of existing facilities or combine both?

On the back of a positive, albeit informal, response, SAIC commissioned Alan Sutherland to undertake a scoping study on the subject. The remit? Gauge industry appetite for a centre of excellence, identify perceived gaps in the existing R&D infrastructure and highlight any other facilities required to accelerate innovation in Scottish aquaculture.

This report summarises the findings and sets out recommendations for the next steps.

1.2 Context

Compared to Scotland, many of the other leading aquaculture-producing countries have considerably more in the way of support for innovating effective solutions to technical challenges, both in terms of R&D activity and infrastructure.

Norway, the number one producer of Atlantic salmon and second largest seafood exporter, has a wealth of internationally renowned organisations providing dedicated support — amongst them, the Norwegian Institute of Food, Fisheries and Aquaculture (NOFIMA); the Centre for Research-based Innovation in Aquaculture Technology (CREATE); and aquatic research facility, VESO Vikan.

Chile, the world’s second biggest salmon exporter after Norway, is home to a number of R&D institutions including AVS Chile, the Instituto de Fomento Pesquero and Intesal, while in British Columbia the BC Centre for Aquatic Health Sciences is currently developing the concept of a BC salmon centre of excellence.

**Present day provision**

That’s not to suggest Scotland isn’t engaged in aquaculture R&D. There are various research facilities doing groundbreaking work in the area, mostly within higher education institutions (HEIs) and government laboratories.

As a whole however, current R&D capacity is limited compared to the ambition of industry and ingenuity of academia.

One result of this is that many of the multi-nationals operating in Scotland undertake their R&D elsewhere. While much of the resulting insights and output can still be used in Scotland, it’s important to recognise that there are significant differences between countries in terms of the marine environment, biological and disease challenges, and the regulatory environment.

Add to this the fact that outsourcing R&D to international providers both reduces the supply chain benefits and the innovative capacity of Scotland, and there is a clear case to be made for ensuring that the Scottish aquaculture industry has the capability and critical facilities necessary to test new approaches in the environments for which they are intended.

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Compared to Scotland, many of the other leading aquaculture-producing countries have considerably more in the way of support for innovating effective solutions to technical challenges, both in terms of R&D activity and infrastructure.
Enhancing capacity

Testament to industry appetite for such capability and critical facilities, all three leading feed firms with a presence in Scotland have R&D facilities located elsewhere: Skretting in Lerang, Norway; Cargill in Dirdal and Lønningdal, Norway, and Colaco, Chile; and BioMar in Hirtshals, Denmark and ATC Patagonia, Chile. Yet each has expressed an explicit desire for R&D infrastructure in Scotland that would enable trials of feed-related products, in order to support new product development for the local market.

Precedent has already been established in the UK with a number of centres of excellence successfully providing dedicated R&D support to other key sectors – Tesco’s new dairy centre of excellence, run in collaboration with the University of Liverpool, being one example of this.

Could the time be ripe for a Scottish centre of aquaculture excellence, be it one facility comprising different specialisms or a coordinated network of specialist facilities, capable of:

- Helping develop and test technological solutions that remove the challenges and bottlenecks currently inhibiting growth in the sector
- Supporting evidence-based improvements to the oversight regime under which Scottish aquaculture currently operates.

This scoping study, commissioned by SAIC and undertaken by experienced aquaculture professional Alan Sutherland, set out to answer these very questions by exploring:

- Whether or not the Scottish aquaculture industry needs and wants a centre of excellence
- Who would lead it
- What it might look like and consist of
- What its priorities should be
- Whether the sector is prepared to contribute towards the costs of creating and running it.

Precedent has already been established in the UK with a number of centres of excellence successfully providing dedicated R&D support to other key sectors
Methodology
2.1 Approach

Using a structured questionnaire survey, backed by interviews, the scoping study sought opinion from across the Scottish aquaculture sector: from producers, processors and the wider supply chain, to third party stakeholders, regulators and the broader research community.

2.2 Number of responses

101 people responded to the survey, via:

- 35 face-to-face meetings
- 19 telephone interviews
- 47 email replies.

Combined, it adds up to an exceptionally high response rate of over 50%, providing an unprecedented insight into the needs, wants and views of the sector.

2.3 Respondent profile

To aid analysis, each respondent was grouped according to one of four profiles:

- **Producers** – finfish and shellfish producers, processors and egg suppliers, large companies and SMEs alike. All respondents in this category were either the most senior representative of the company (most typically, the Managing Director) or, in a small number of cases, a member of the senior management team.

- **Suppliers** – representing the wider supply chain, from feed producers to equipment manufacturers, and from large companies to small companies.

- **Academics** – the most senior aquaculture-related academics from a range of HEIs including the Universities of Aberdeen, St. Andrews and Stirling, and other R&D organisations and institutes such as the Marine Alliance for Science and Technology for Scotland (MASTS), NOFIMA, the Scottish Alliance for Marine Science (MASTS) and Scotland’s Rural College (SRUC).

- **Other stakeholders** – including representatives from other governmental and non-governmental agencies as well as trade organisations.

2.4 Response by profile group

Table 1 below shows how many respondents represented each group.

<table>
<thead>
<tr>
<th>Producers (large companies to SMEs)</th>
<th>Supply chain</th>
<th>Academia (HEIs and research institutes)</th>
<th>Other stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>42</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>
Key findings
3. Key findings

3.1 Demand

First and foremost, respondents were asked whether they agreed that Scottish aquaculture would benefit from having a centre of excellence in Scotland – and if so, how strongly.

All four profile groups expressed the firm belief that Scottish aquaculture would indeed benefit from such a facility or network of facilities, with 84% of respondents saying either they strongly agree or agree.

Of the remaining 16% of respondents:

- Only 1% said they did not support the concept of a centre of innovation excellence
- The remaining 15% said they were unsure.

In some cases, this uncertainty reflected a concern that the centre of excellence may overlap with existing organisations or facilities. (Though as noted in the executive summary, there was little desire amongst any of the respondents to replicate existing infrastructure where capacity already exists.)
In other instances, this uncertainty arose from the very term ‘centre of excellence’, with some respondents being wary about its meaning and the potential for misinterpretation – a key consideration that is addressed further on in the Recommendations section.

However, for the purposes of consistency, the concept shall continue to be referred to as a centre of excellence for the remainder of this document.

“A good idea but must involve all parts of the industry, large and small, and not be too salmon-centred.”

“I’d be thrilled to see a Scottish centre of excellence where new techniques, products and processes could be developed.”
3.2 Leadership

Respondents were then asked who they thought should lead the proposed centre of excellence: industry members, academia, a government body, a public-private sector partnership or ‘other’.

3.2.1 Support for a public-private partnership

Across the sector there is a strong preference for the centre of excellence to be a public-private partnership, with over 50% of respondents opting for this leadership model. This preference was consistent across all four groups, with the exception of academics who voted it first equal.

3.2.2 Industry leadership

Those favouring a public-private sector partnership proposed a range of different consortium models: from industry-academia or industry-government, to industry-academia-government or a mix of stakeholders.

There was also a smaller but not insignificant number of respondents in favour of having an industry-only leadership model. Around a quarter of respondents advocated this model, most being suppliers or academics.

The key thing of note, however, is the importance placed on industry leadership in one form or another.

TABLE 2: LEADERSHIP

<table>
<thead>
<tr>
<th>Who should lead the proposed centre of excellence?</th>
<th>All (%)</th>
<th>Producers (%)</th>
<th>Suppliers (%)</th>
<th>Academics (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry members</td>
<td>31</td>
<td>26</td>
<td>43</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>Academia</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Government body</td>
<td>10</td>
<td>15</td>
<td>2</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Public-private sector partnership</td>
<td>35</td>
<td>37</td>
<td>39</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>11</td>
<td>11</td>
<td>30</td>
<td>19</td>
</tr>
</tbody>
</table>

The highlighted numbers indicate the highest responses in each category. Note that the responses do not add up to 100% because some respondents were in favour of more than one approach.

“Accepting that the growth of the aquaculture industry is a national policy objective, it is hard to conceive how a new centre of excellence could be drawn up without considering how existing government and university facilities could be brought in as part of the whole.”
3.2.3 Government involvement
Those supporting a public-private sector partnership saw two main benefits to governmental involvement: one, an increased likelihood of supportive funding; two, greater scope to ensure that the centre of excellence both supports existing policy and informs future legislation.

3.2.4 Academic involvement
No respondent was in favour of the centre of excellence being led exclusively by HEIs or academia, and only 9% of respondents were in support of academia being co-leaders. (Note that these comments were in relation to the question of leadership only and were in no way a reflection of support for academia working within the centre of excellence.)

Amongst academics themselves, there were mixed preferences over who should lead the centre of excellence, with no single leadership model dominating.

3.2.5 A flexible model
During some surveys, it was suggested that the leadership model might also change over time in response to changes in the centre of excellence’s priorities and, in turn, the expertise required. It was also suggested that as the centre of excellence evolves, it might require higher levels of executive or operational management.

With both these points in mind, a degree of flexibility is considered desirable in order to future-proof the chosen leadership model.

“My preference would be a public-private sector partnership. Having said that, I think industry will be absolutely key to driving such an initiative forward.”
3.3 Composition

3.3.1 Best use of existing resources
When asked what they would expect a centre of excellence to look like or comprise, over 40% of respondents expressed a clear preference that the adopted model should make use of Scotland’s existing facilities first and foremost, supported thereafter by any new facilities required to address gaps in current service delivery.

No respondent wanted to see the centre of excellence reinvent the wheel or duplicate bricks and mortar where the same capability already exists.

Nor did respondents expect the centre of excellence to be based at a single location. Rather, respondents across all four groups want to see better access to, and better utilisation of, existing facilities and research capabilities – starting with a clear overview of current R&D capacity in Scotland.

There was little support for the centre of excellence being based at a HEI or government lab, and even those respondents who did recommend using such facilities tended to propose doing so in combination with other facilities.

3.3.2 Virtual versus fixed approach
Respondents surveyed in person or by phone were probed a little further on the best composition of the centre of excellence and asked about their views on having a ‘virtual’ centre of excellence. In other words, a centre without a dedicated physical headquarters.

18% of those asked indicated some enthusiasm for this concept. The remainder met the suggestion with a degree of scepticism and confusion, indicating that some form of physical ‘hub’ to coordinate the work of the centre of excellence network will be necessary in providing the appropriate service levels.

<table>
<thead>
<tr>
<th>What would a centre of excellence look like?</th>
<th>All (%)</th>
<th>Producers (%)</th>
<th>Suppliers (%)</th>
<th>Academics (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building at university or HEI</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Government labs</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lab/aquaria</td>
<td>9</td>
<td>13</td>
<td>9</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Field trial facility</td>
<td>20</td>
<td>22</td>
<td>26</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Combination of new and existing facilities</td>
<td>29</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>Virtual entity</td>
<td>18</td>
<td>17</td>
<td>6</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>20</td>
<td>19</td>
<td>4</td>
<td>23</td>
</tr>
</tbody>
</table>

The highlighted numbers indicate the highest responses in each category. Note that the responses do not add up to 100% because some respondents were in favour of more than one approach.

“We need to make better use of existing resources, but also ensure that best practice is held in a centralised place.”

“We need to recognise and identify who specialises in what, rather than create a centre with diluted excellence under one roof.”
3.4 Location

The question of where best to locate the proposed centre of excellence – or network of excellence – was also discussed.

Most respondents preferred an integrated network of facilities, as opposed to a standalone facility, with the result that specific geographies were of less relevance.

“A combination of facilities would be best, but the head office or centre should be on the west coast.”

For those that did express a strong preference in terms of location, most favoured the centre of excellence being based where the aquaculture industry is most active – namely, the Argyll and Lochaber regions, both of which were frequently referenced.

An Lòchran Enterprise and Research Centre in Inverness was also suggested as a possible hub for the centre of excellence.

“Perhaps have one central office, but otherwise share the opportunity among existing infrastructure.”
### 3.5 Facilities and specialisms

In particular, respondents perceived there to be a real lack of existing infrastructure to support feed trials and studies for fish in the second half of their growth cycle. A key ‘ask’, therefore, in terms of which facilities would most help Scottish aquaculture businesses to grow, was for the centre of excellence to include seawater and freshwater field trial facilities.

Whilst existing tanks, pens, lab space and consents would be utilised wherever possible, it is likely that new infrastructure would be required in order to support industry ambition in this area.

#### TABLE 4: FACILITIES AND SPECIALISMS

<table>
<thead>
<tr>
<th>Which specialism would most benefit your company/Scottish aquaculture?</th>
<th>All (%)</th>
<th>Producers (%)</th>
<th>Suppliers (%)</th>
<th>Academics (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cages and aquatic testing (field trials)</td>
<td>33</td>
<td>24</td>
<td>40</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>Production capabilities (aquaria)</td>
<td>19</td>
<td>19</td>
<td>17</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Dry lab and tech development</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Vaccine and pharmaceutical testing</td>
<td>15</td>
<td>20</td>
<td>12</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>22</td>
<td>15</td>
<td>10</td>
<td>29</td>
</tr>
</tbody>
</table>

The highlighted numbers indicate the highest responses in each category. Note that the responses do not add up to 100% because some respondents were in favour of more than one approach.

“The current and crucial weakness in Scotland’s aquaculture research capacity is a suite of accessible trial facilities in freshwater and seawater.”

“Securing dedicated trial locations would avoid the costly and time-consuming process of having to apply for permissions each time a new technology or species is to be trialled in a location.”
### 3.6 Priority areas

Respondents were asked to identify their three main priorities for a centre of excellence, selecting from an eight-strong list of major industry issues (below).

The issues of sea lice and gill health emerged as a clear priority for producers, suppliers and academics. Environmental challenges were also high on the list, as was sharing best practice and knowledge exchange.

<table>
<thead>
<tr>
<th>What do you see as being the top 3 priorities?</th>
<th>All (%)</th>
<th>Producers (%)</th>
<th>Suppliers (%)</th>
<th>Academics (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea lice and gill health</td>
<td>25</td>
<td>23</td>
<td>28</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Cleaner fish production</td>
<td>7</td>
<td>3</td>
<td>9</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Feed formulation</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Vaccine and medicines</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Production in more exposed locations</td>
<td>11</td>
<td>5</td>
<td>15</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Environmental challenges</td>
<td>17</td>
<td>16</td>
<td>19</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Training</td>
<td>12</td>
<td>18</td>
<td>11</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>18</td>
<td>5</td>
<td>12</td>
<td>34</td>
</tr>
</tbody>
</table>

*The highlighted numbers indicate the highest responses in each category. Note that the responses do not add up to 100% because some respondents were in favour of more than one approach.*

“Priorities should be aligned to the industry growth strategy; the focus should be broader than primary production.”

### 3.6.1 Additional areas

When respondents were asked what additional areas they would like the centre of excellence to address, their answers highlighted a real diversity in needs across the sector. However, amongst the most frequent suggestions were:

- Mortality reduction/improved smoltification
- Genetics/breeding for health and quality
- Addressing regulatory and planning challenges
- Development of new species.
3.7 Potential projects

Just as needs and priorities differed amongst respondents, so too did opinion on potential projects. A whole host of emerging themes were discussed, alongside long-established themes such as environmental and biological challenges.

3.7.1 Project areas by popularity

The major candidate projects for field trialling facilities, listed in order of popularity, are:

1. Feed formulation and performance, investigation into novel protein and oil sources
2. Breeding and genetics to improve health, growth, FCR and yield
3. Production of larger smolts, production of out-of-season smolts, improving smolt viability, innovation in recirculating aquaculture systems, and improved testing of smoltification and fungal control
4. Diversification and novel species development
5. Biotoxin monitoring and tubeworm resistance
6. Organoleptic testing and reduction of rejects
7. Non-medicinal sea lice management and lice filtration
8. Gill health
9. Triploid production and sterile fish
10. Improved oxygenation during crowding, harvesting, bath treatments and general husbandry activities as well as more effective removal of CO2
11. Full cycle solution to disposal of mortality and fish waste, and conversion of fish waste into cost reducing/income generating applications
12. Improved welfare for stock and non-lethal predator deterrents.

3.7.2 Striking the right balance

Clearly, in shaping a centre of excellence that delivers maximum benefit to the sector, there is a fine balance to be struck between focusing on the headline priorities of the industry – sea lice, for example – and specific niche opportunities that could generate business growth or export of Scottish know-how if the appropriate applied R&D facilities were to become available.

3.7.3 Representing the wider sector

Closely related to this, several producers, suppliers and stakeholders were explicit in their desire that the centre of excellence should not be wholly or overly salmon-focused.

Rather, they saw real opportunity for new infrastructure to accelerate innovation – and, therefore, business opportunities – in shellfish production, algal production, development of new species, and growth of the indigenous equipment supply chain.

“There should also be an element of ‘looking to the future’; issues alter with time. Flexibility and responsiveness to changes will be essential.”
3.8 Investment

Producers, suppliers and stakeholders alike readily professed a willingness to support the centre of excellence concept, whether by in-kind contributions, paying commercial rates for the use of facilities or a combination of both.

3.8.1 In-kind contributions

Some respondents would be willing for their company or organisation’s existing facilities – land-based, freshwater or seawater – to be used as part of the centre of excellence.

Other in-kind contributions discussed include sharing expertise (whether general or issue-specific such as genetics), staff time and use of equipment. Representatives from some 30 different businesses said they would be happy to offer this kind of support, albeit this was often qualified as ‘appropriate support’ or ‘when supportive of our goals’.

3.8.2 Commercial rates

There was also a willingness amongst many respondents to pay commercial rates for using the centre of excellence’s facilities, and perhaps even to relocate R&D activities from other countries or regions if facilities were to become available in Scotland.

Academics were equally keen to connect via a centre of excellence facility, whether by collaborating on specific issues, becoming members or providing facilities, while other stakeholders were prepared to offer training, internships, facilities and access to expertise.

“We could certainly offer use of some facilities and our expertise.”

“Our group will be an active partner in the proposal, with support (time, facilities, etc.) as appropriate.”
3.9 Perceived challenges

The scoping study highlighted two perceived challenges: one, raising and sustaining the necessary funding to support the centre of excellence in the short and longer term; two, planning and regulatory issues.

3.9.1 Funding challenges

Whilst there was cross-sector enthusiasm for a centre of excellence, equally there is cross-sector concern that it might duplicate existing activity, involve expensive new facilities or structures, or dilute existing investment in Scotland.

There was also concern about the sustainability of funding; that the centre of excellence, once established, might face future challenges in meeting ongoing running costs.

That said, 97 of the 101 respondents stated that they would be willing to support the centre of excellence, whether through direct funding, in-kind support or by paying commercial rates to utilise facilities. This would indicate that the network of excellence model could be viable in both the medium and long-term.

3.9.2 Planning and regulatory issues

When discussing the priority areas, possible specialisms and potential projects for the centre of excellence, almost two-thirds of producers and a significant number of suppliers expressed the view that planning and regulation are stifling growth of the Scottish aquaculture industry.

As such, there was a strong feeling that a key role of the centre of excellence should be to inform and contribute to the knowledge base that underpins an innovative regulatory environment in Scotland: from working with regulators and ensuring that regulation is science and evidence-based, to supporting regulatory science through industry-sponsored solutions.

"Funding a centre of excellence will be challenging without EU support, but we should all be ambitious."

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Recommendations
4. Recommendations

4.1 Timely action

Given that there is clear support from across the sector, and from a broad range of stakeholders, for a dedicated centre of excellence of some shape and form, it is important that momentum is not lost and that timely action is taken. With this in mind, there are five key recommendations.

4.2 Key recommendations

4.2.1 Establish the nodes in an organisational infrastructure

The majority view is that the centre of excellence should not be a standalone entity. Rather, it should be a network of facilities that makes better use of current provision and addresses any gaps that exist outwith that.

However, there is still work to be done to identify whether this network of excellence should be entirely virtual or whether, as feedback from the scoping study would suggest, it should adopt a ‘hub and spoke’ model.

To help reach a clear and informed decision on the organisational infrastructure, it is recommended that Scotland’s existing R&D facilities be mapped out to:

- Gain a clear picture of current provision
- Highlight gaps in provision
- Identify a potential ‘hub’ location to help coordinate the work of the network.

4.2.2 Agree a leadership structure

Industry leadership was seen as critical to the long-term success of the centre of excellence, ideally as part of a public-private sector partnership.

There are a number of ways in which this public-private sector partnership could be realised, including establishing the centre of excellence as:

- A department within a Scottish HEI – potentially the most straightforward option but unlikely to be the sector’s preferred model given the lack of appetite for an academic-led centre of excellence
- A subsidiary of an existing organisation/entity (SAIC/SSPO/ILG) – with the backing of industry and stakeholders, SAIC could still play a formative role in helping drive forward the centre of excellence-related activities in the short-term, while its longer term future is being agreed
- Standalone entity – requiring, in turn, a standalone Board and/or executive team.

4.2.3 Set out a clear remit

The scoping study highlighted a clear need for seawater and freshwater field trial facilities. Less clear however, is the exact remit the centre of excellence should have, with different respondents favouring different priority areas and potential projects.

It is recommended that the merits of each be assessed to determine which would deliver the biggest benefit to Scottish aquaculture, with consideration given to how best to benefit both the finfish and shellfish sectors.

“I think we might find another name for the initiative that better describes what is required, i.e. a network of facilities and competencies that enhances opportunities for applied research and development relevant to the needs of a growing aquaculture sector.”
The majority view is that the centre of excellence should not be a standalone entity. Rather, it should be a network of facilities that makes better use of current provision and addresses any gaps that exist outwith that.

“Such a facility would, when established, be self-supporting and ideally profitable.”

“The model should be able to stimulate, accelerate and support world-leading sector growth. However, existing resources should be used to their optimum.”
4.2.4 Identify funding models
How best to fund a centre of excellence is another critical issue. While it is anticipated that EMFF funding would play a key role in the short-term, different options should be explored by looking to other successful models at home and abroad.

Thereafter, a business plan should be produced, outlining the proposed approach for making the centre of excellence self-sustaining in the long-term.

4.2.5 Clarify the working title for the concept
In light of respondents’ preference for a network of research excellence, as opposed to one physical centre or building, it is recommended that a new working title be generated to more accurately reflect the structure and purpose of the concept.

Collaboration is key
It became apparent from the scoping study that there are several parallel conversations ongoing about similar concepts. Rather than duplicate time and effort, ways of collaborating across the different groups should be sought to better serve the needs of the industry.

Industry leadership was seen as critical to the long-term success of the centre of excellence, ideally as part of a public-private sector partnership.
Next steps
Drawing from the afore-mentioned recommendations, the proposed priority actions are to:

1. Establish a steering group of supportive parties to explore how best to take the centre of excellence concept to the next stage, as a precursor to any further commitment

2. Conduct a gap analysis to identify and map existing research facilities in Scotland that could potentially support centre of excellence activities

3. Review existing UK/Norwegian centre of excellence models, as well as Scottish industry leadership groups, seeking any lessons that can be learned

4. Prepare a database to identify companies and individuals who stated a willingness to collaborate in developing the new infrastructure required to support a centre of excellence

5. Draw up a list of commercial projects for the centre of excellence

6. Create a list of companies requiring resources for innovation activities, then cross-reference with those offering the relevant resources to enable SAIC to investigate opportunities for collaboration

7. Identify candidate sites/facilities suitable for acquisition or lease

8. Write a business plan for the centre of excellence and explore possible funding opportunities.

“If you could link together better the existing facilities, you could have a real powerhouse.”

“There are a number of organisations actively and successfully delivering relevant work, and it may be more appropriate to look at linkages and profile.”
Appendix A: Questionnaire short form template

Do you agree that Scottish aquaculture would benefit from a national centre of excellence?


Who do you think should lead the proposed centre of excellence? (If ‘other’ please explain.)


What would you expect a centre of excellence to look like or comprise? (If ‘other’ please explain.)

☐ 1. Building at university or HEI  ☐ 2. Government labs  ☐ 3. Lab/aquaria  ☐ 4. Field trial(s) facility  ☐ 5. Combination of new and existing facilities

☐ 6. Virtual entity  ☐ 7. Other

Which centre of excellence specialism would most help your company to grow? (If ‘other’ please explain.)

☐ 1. Cages and aquatic testing (field trials)  ☐ 2. Production capabilities (aquaria)  ☐ 3. Dry lab and tech development  ☐ 4. Vaccine and pharmaceutical testing  ☐ 5. Other

☐ 6. Sea lice and gill health  ☐ 7. Other

What do you see as being the centre of excellence’s top three priorities? (If ‘other’ please explain.)

☐ 1. Cages and aquatic testing (field trials)  ☐ 2. Cleaner fish production  ☐ 3. Feed formulation  ☐ 4. Vaccine and medicines  ☐ 5. Production in more exposed locations


What do you consider to be the emerging trends in Scottish aquaculture that may eventually require attention from/be candidate projects for a proposed centre of excellence?

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How do you envisage your company or organisation interfacing/supporting a proposed Scottish aquaculture centre of excellence (funding, provision of facilities etc.)?

Are there any business development activities dependent on applied research that you would like to undertake in Scotland but currently cannot?

Do you have any further comments, suggestions or ideas regarding a proposed Scottish aquaculture centre of excellence?

If you wish to discuss any aspect of the proposed Scottish aquaculture centre of excellence in more detail, please contact alan@agsutherland.co.uk, +44 (0)7501 823988
“The scoping study has provided some valuable insights for SAIC and other relevant organisations who I believe should now act upon the strong support shown and take the next steps towards establishing a centre of innovation excellence.”

Alan Sutherland