Submission to Te Ara Paerangi Strategic Pathways Green Paper from the Science Leaders of Shellfish Aquaculture and Seafood Safety SSIF Platforms

This submission is made by the science leadership teams of two research platforms led by Cawthron Institute and funded under the Strategic Science Investment Fund (SSIF); The Shellfish Aquaculture Research Platform, and the Seafood Safety Research Platform. These two platforms transitioned from Endeavour-type funding through IRO capability funding to SSIF.

We have found the SSIF model to be highly successful in a number of areas highlighted for review by Te Ara Paerangi Future Pathways process.

Within our platforms in contrast to previously relying entirely on contestable funding, the **stability of funding** from the SSIF has enabled us to have the confidence **to invest in capability development**, particularly in hiring emerging scientists as post-doctoral level, but also enables us to have a clear pipeline from PhD students to post docs, early-career researchers, and established senior scientists. This has significantly increased capability, capacity to deliver, and reduced risk. It has increased the resilience of the strategic capability area (Shellfish Aquaculture and Seafood Safety), and with more post-doctoral hires, indirectly increased linkages with university partners in NZ and abroad.

The stability of funding has also given us confidence to invest in necessary **research infrastructure**, in a way that would be very difficult when previously as an independent research organisation, all of our government funding was from shorter-term competitive funding sources. The ability to have confidence to invest in research infrastructure further increases the resilience and capacity of the platform to deliver.

The SSIF platform structure **facilitates effective collaboration** and bringing together of the **best research team**, thus reducing unnecessary duplication of effort or key infrastructure within NZ. Both of our platforms **have significant collaboration with Industry, iwi, CRIs, and universities as well as government agencies** such as MPI. Both platforms have significant input from other NZ research institutions including Plant and Food Research, AgResearch, ESR, and most of the NZ Universities.

Our KPIs have been developed together with MIBE and include research impact along with science excellence and capability building to give a balanced return for investment.

The programmes have both Stakeholder Advisory Group (SAG) annual meetings and an International Advisory Panel, which balances the need to **align to industry and government needs and strategies** to create meaningful and implementable impact in NZ, with maintaining the high calibre of research and keeping an international perspective. A **kahui process** maintains engagement, communication, connection and collaboration with **Māori as research partners**, not just owners of businesses that may benefit from research outcomes.

The SAGs ensure that there is frequent and ongoing communication with industry and feedback on priorities within the research programme, and the platform stability means that in addition to researchers being able to be agile and reactive, they can also also steer the ship and maintain ongoing longer-term research that may be necessary to achieve larger or more long-term strategic goals. We believe this ability to be both **agile AND have long-term stability** is key to achieving high impact in both the short and long term. It cannot be one or the other.

SSIF has enabled us to **build enduring relationships alongside industry that maximise real-world impact from our research**. By working with industry from the outset, we can deliver workable solutions that are used and deliver real-world value.

Prioritisation is achieved by making sure all stakeholders are represented at the table for input, so that prioritisation of funding **within** the platform balances researcher perspectives with those of industry, iwi, and government against a set of criteria that we have developed, including level of impact/overall benefit, likelihood of impact, spill-over, achievement of vision mātauranga, cost-benefit, strategic alignment, new knowledge creation, and relevance to future context. Thus, the priorities assess economic, social, cultural, and environmental impacts and objectives, and make sure we are **moving toward equity.**

We also operate a **competitive 'innovation fund'** *within* our Shellfish Aquaculture Platform to enable researcher-driven generation of new ideas, and potentially transition these into our core work programme. This balances the need for focus and delivery with innovation and continuous improvement.

Other feedback from our perspective regarding some of the specific questions asked in Te Ara Paerangi Future Pathways Green Paper:

1. **What principles could be used to determine the scope and focus of research priorities?**

   Research prioritised based on economic, environmental, and social/cultural impacts and benefits, that ensures we are moving toward equity in Aotearoa, but also placed in an international context (i.e. what's happening elsewhere, research trends). Ensure priority mechanisms can recognise and balance the value of long-term, underpinning capability (and programmatic research) for existing industries, as well as new/emerging priorities.

   SSIF takes a horizon balancing approach; this is a useful model, explicitly recognising the importance of simultaneously considering the whole research pipeline, with short, medium and long-term pathways to impact, as well as balancing conservative and risky science.

2. **What principles should guide a national research priority-setting process and how can the process best give effect to Te Tiriti?**

   Involve iwi as parallel partners in priority setting right from the start, and through implementation to impact. Recognise that research can contribute to Māori aspirations (e.g., commercial opportunities for Māori) in addition to mātauranga integration with/alongside science. The latter is clearly good, but it should be recognised that research without mātauranga components can also directly benefit Māori.

3. **How should the strategy for each research priority be set and how do we operationalise them?**

   In consultation with researchers and iwi. Once a priority is set, divest implementation to researchers and partners where appropriate (i.e. like SSIF). This needs to be a robust and transparent process to avoid conflicts of interest (i.e., not like some NSCs). In the context of SSIF, identify the best team with established research track record. If the best team is not obvious, competitive processes can ensure transparency and equal opportunity.

The SSIF devolvement approach effectively transfers research prioritisation and strategy to the research provider, informed by their stakeholder relationships once the strategic science area and team is identified. This represents a more agile approach when compared to centralised prioritisation by government but introduces the risk that researcher and stakeholder perspectives are not considered equally. A formal platform/project-specific stakeholder guidance process may be more effective.

5 and 6. What are your thoughts on how to enable and protect mātauranga Māori in the research system? And what are your thoughts on regionally based Māori knowledge hubs?

Regional hubs may be a mechanism to break knowledge transfer barriers and enable reciprocal meaningful interactions, but the purpose needs to be well defined and there needs to be a clear understanding and acceptance of differences in world views and principles.

While a 'Māori knowledge hub' may have some administrative benefits, it is not likely to further goals to better integrate mātauranga and traditional science paradigms. The Cawthron SSIF experience is that we have integrated Māori scholars into the research team, providing a holistic landscape for knowledge generation. However, these are early days and established researchers continue to struggle to find and accommodate mātauranga to broaden their own professional perspective. A more enduring integration requires support for emerging researchers committed to incorporating both mātauranga and empirical science philosophies in their day-to-day work.

7. How should we determine what constitutes a core function and how do we fund them?

Some of the principles mentioned in Question 1 will be useful for priority setting and balancing the impact and importance of different potential core services/data etc. This needs to be a robust and very transparent process to avoid conflicts of interest, and needs to be comprehensive and inclusive, ensuring it gives voice to all stakeholders including those who are not well represented.

8. Do you think a base grant funding model will improve stability and resilience for organisations? How should we go about designing and implementing such a funding model?

'Base funding' would no doubt provide stability, but as we understand it, it would not be tied to delivering specific research activity. SSIF is an alternate/complementary mechanism that provides (relative) stability but is focused toward delivering tangible outcomes. We believe this is arguably a wiser return on investment model. The SSIF model is also very agile at responding to new priorities while being able to sunset other work.

It is not an exaggeration to say that SSIF Platform funding has transformed our in-house research environment. With secure base funding we have been able to invest substantially in building a team of dynamic, emerging researchers, aligned with stakeholder needs and values. Our return-on-investment impact has correspondingly increased dramatically. The nature of SSIF is, however, still institution- or platform-specific. A more comprehensive and collaborative evolution of the SSIF model could separate platform funding for:

a) Core resources within-institutions = baseline facilities and staff FTE

b) Collaborative inter-institution research platforms – essentially following the current Cawthron SSIF models.

c) Capability pipeline - targeted support for students, emerging researchers, mātauranga practitioners and within-industry researchers to enter the research platforms.

Where A-C are integrated, devolved/non-competitive funds.

Within our particular platforms, it would be a risk to us if our institution (Cawthron) were to receive base funding comparable to our current SSIF, but it were no longer earmarked specifically for programmes of research. In the context of SSIF, we would argue that we want secure *programmatic* funding. However, at an institutional level, a big positive of base funding would be to make our research services cheaper and therefore more accessible to industry – we see this as a big current issue in NZ RS&T system. Base funding would therefore be a good outcome to get industry more willing and able to invest in research.

9. How do we design collaborative, adaptive and agile research institutions that will serve our current and future needs?

Security of funding, within and across institutions such as SSIF, as outlined above will help, but with key institutions represented at the leadership table. Virtual research platforms/entities that bring expertise together can also complement physical entities.

10. How can institutions be designed to better support capability, skills and workforce development?

Please see our general discussion of the SSIF experience, and Q. 8.

11. How should we make decisions on large property and capital investments under a more coordinated approach?

Priority focused investment at a national level should be decided on a case by case basis (e.g., National Algal Research Centre in Nelson). This requires national-level oversight and understanding of RS&T infrastructure, which would come from national priority setting, and secure funding to build and run facilities. These should then allow universal usage by all scientists if they have funding to deliver a priority (i.e. similar to New Zealand eScience Infrastructure).

13. How do we better support knowledge exchange and impact generation? What should be the role of research institutions in transferring knowledge into operational environments and technologies?

We believe that the Shellfish Aquaculture SSIF platform is a good example of this. Incentivise end-users to work alongside researchers as parallel partners. Incentivise or prioritise evidence of science impact as opposed to bibliometric outcomes for platforms or institutions.

14. 15. and 16. How should we include workforce considerations in the design of research Priorities? What impact would a base grant have on the research workforce? How do we design new funding mechanisms that strongly focus on workforce outcomes?

See general response and Q. 8

A mix of mechanisms are needed that recognise the diversity of researchers (and their disciplines) in NZ. Competitive mechanisms can be better in some instances and can provide more equal opportunity (i.e., as opposed to mechanisms such as NSCs). Secure funding such as SSIF is better in other instances and has a particular strength of enabling ECRs to establish themselves (as evidenced by the Shellfish Aquaculture Research Platform).