From: no-reply@mbie.govt.nz

To: Research, Science and Innovation Strategy Secretariat

Subject: Draft Research, Science and Innovation Strategy submission

Date: Thursday, 7 November 2019 5:19:45 p.m.

Attachments: Online-submission-form-uploadsdraft-research-science-and-innovation-strategy-submissionsAWNSC-

submission-form-research-science-and-innovation-strategy-071119.pdf

Submission on Draft Research, Science and Innovation Strategy recevied:

Are you making your submission as an individual, or on behalf of an organisation?

Organisation

Name

Lisa Davis

Name of organisation or institutional affiliation

Ageing Well National Science Challenge

Role within organisation

Manager

Email address (in case we would like to follow up with you further about your submission)

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Which of the below areas do you feel represents your perspective as a submitter? (Please select all that apply)

If you selected other, please specify here:

Gender

Ethnicity

Name of organisation on whose behalf you are submitting, if different to the organisation named above

In which sector does your organisation operate: (Please select all that apply)
Research

If you selected other, please specify here:

How large is your organisation (in number of full-time-equivalent employees)? 4 FTE, 100+ researchers

Please indicate if you would like some or all of the information you provide in your submission kept in confidence, and if so which information.

Please upload your submission document here

AWNSC-submission-form-research-science-and-innovation-strategy-071119.pdf - <u>Download File</u>





Research, Science and Innovation Strategy **Submission form**

The Government is developing a Research, Science and Innovation (RSI) Strategy to set out our vision for RSI in New Zealand and its role in delivering a productive, sustainable, and inclusive future.

We are keen to hear the views of New Zealanders on the draft Strategy so that we can get a better understanding of what our country needs from RSI. We also are looking for feedback on how we can take action to ensure New Zealand's RSI system is optimised for success. These views will inform the direction of Government investment in RSI and the research and innovation areas for us to focus on as a country, as well as help us understand the challenges we need to overcome.

We encourage anyone with an interest to make a written submission.

How to have a say

We have included a number of questions in the draft RSI Strategy document to highlight issues on which we would like further input. We encourage you to use these questions as a guide when submitting your feedback.

This document provides a template for you to provide your answers. Please upload the completed document using our <u>online submission page</u>.

You do not have to fill out every section – we welcome submissions on some or all of the questions.

The closing date for submissions is 10 November 2019.

After the consultation period finishes, we will analyse the submissions received and incorporate the feedback in the final version of the strategy.

Confidentiality

Please note: All information you provide to MBIE in your submission could be subject to release under the Official Information Act. This includes personal details such as your name or email address, as well as your responses to the questions. MBIE generally releases the information it holds from consultation when requested, and will sometimes publish it by making it available on the MBIE website.

If you do <u>not</u> want some or all the information you provide as part of this consultation to be made public, please let us know when you upload your submission. This does not guarantee that we will not release this information as we may be required to by law. It does mean that we will contact you if we are considering releasing information that you have asked that we keep in confidence, and we will take your reasons for seeking confidentiality into account when making a decision on whether to release it.

If you do not specify that you would prefer that information you provide is kept in confidence, your submission will be made public. While we will do our best to let you know that we plan to publish your submission before we do so, we cannot guarantee that we will be able to do this.

Contribution of Research, Science and Innovation

This strategy is about New Zealand's Research, Science and Innovation (RSI) at a high-level. Its aim is to identify challenges and opportunities that will have the broadest impact on our research and innovation activities. For this reason, it mentions few specific areas or sectors of research and innovation. For this draft version of the Strategy, we are keen to hear from researchers, innovators, businesses, and providers of public services on what the RSI system could be doing to accelerate progress on Government's priorities.

Question 1: Where can the RSI system make the greatest contribution towards the

transition to a clean, green, carbon-neutral New Zealand?

Question 2: Where else do you see it making a major contribution?

Question 3: What else could else the RSI system be doing to accelerate the progress

towards the Government's priorities*?

* see list of the Government's twelve priorities included in Part 1 of the draft Strategy.

- Question 2. Where else may RSI contribute?
 - RSI Strategy should affect all sectors of society, from health, justice, education, environment and social needs. The impact of this Strategy is broad reaching because it determines where funds will be invested that will have impact on knowledge used or implemented in other sectors.
- Question 3. Accelerating progress.
 - The key way to enhance progress is to change behaviour across the RSI sector. Which behaviours are desirable and facilitate desired change and which are unwanted and slow or created barriers to change.
 - Can progression be measured at an individual level? If behaviours can be measured and weighted during the grant application review process and reported on, the strategy will be embedded quickly.

Researching and innovating towards the frontier

- Question 4: Do you agree that the RSI Strategy should be focused on innovation at the "frontier" (creating new knowledge) rather than behind the frontier (using existing knowledge to improve the ways we do things)?
- Question 5: In which research and innovation areas does New Zealand have an ability to solve problems that nobody else in the world has solved? Why?
- Question 6: In which areas does New Zealand have a unique opportunity to become a world leader? Why?
- Question 7: What do you consider to be the unique opportunities or advantages available to the RSI system in New Zealand?
- Question 8: What RSI challenges are unique to New Zealand, that New Zealand is the only country likely to address?
- Question 9: What are the challenges of innovating in the public sector? How do they differ from those in the private sector?

- Question 4. Frontiers definitions.
 - Does the NZ public fit in the "at" and "behind the frontiers" definitions of innovation on p11 and 18? For each, is the public involved in the research at consultation, data collection and analysis, dissemination and/or impact stages?
 The priorities are logical.
- Question 5. Unique problem solving in NZ.
 - Māori knowledge (mātauranga) and health are strong unique areas of expertise that cannot be done elsewhere.
 - Pacific peoples' knowledge and health are also stronger in NZ than the rest of the world
 - Health and wellbeing research is strong from basic, translational, clinical, datasets and collections and public health fields. Aligning a proportion of funds to better meet NZ's specific needs would enhance impact and public good. Enhancing connections within this field is needed to break down siloed
 - Research on native species and habitats is also strong and should only be done in NZ.
- Question 6. Unique opportunity to become a world leader.
 - We are, and could strengthen, NZ's reputation as world leaders of Indigenous health and mātauranga research.
 - Birth cohort studies (e.g. Dunedin study) exceptional retention rate and how this was achieved over 45+ years.
- Question 7. Unique RSI opportunities in NZ. See question 5.
 - See question 5.
 - Geological challenges and resilience to significant/catastrophic events.
- Question 8. Unique RSI challenges in NZ

Māori and Pacific knowledge and health, native species and habitats, as per question 5.

Our key challenge - Connectivity

Question 10: Do you agree that a key challenge for the RSI system is enabling stronger connections? Why or why not?

Please type your submission below.

- Question 10. Stronger connections.
 - Strong enduring connections should be fostered, measured and rewarded (viewed positively by assessment metrics). Strong relationships are key to finding novel solutions and innovations. The statements about Māori communities not seeing benefit from engaging with the RSI system is true. However, it does not include insight about the importance of reciprocity as a Māori principle. To address this, the paragraph should also reflect that the RSI system has not, and still often struggles with, accepting Mātauranga Māori as a valid science knowledge system.
 - Internationally global experts compared to a New Zealand focus. This balance is too internationally focused in some fields (e.g. biomedical) and may be too New Zealand focused in others. Balance is needed in all fields.
 - Weak science-business relationships. Is this weak relationship these fields are rarely in the same spaces to have critical discussions? A barrier can be reduced by offering opportunities for scientists and business sectors to engage. These opportunities need to be scheduled months in advance and disseminated widely to ensure time can be found in calendars. If they are going to happen periodically, then this should be announced to maximise uptake.
 - The document implies that the business aspect of this relationship has had several failings e.g. operating in international markets and low % of innovative business. Has sufficient time passed to measure success of the R&D Tax Incentive? What other strategies will be used if the science-business relationship is considered unsuccessful in the long-term?
 - Research is needed to understand why business-science relationships are weak before money is invested in solutions-focused strategies. Stakeholder's perspectives (p23) may not describe the full story. A wider survey across business and science sectors is needed.

Guiding Policy – Excellence

- Question 11: Do you agree with the definition of excellence presented here as the best thing possible in its context? Why or why not?
- Question 12: How can we achieve diversity within our research workforce? What are the current barriers preventing a diverse range of talent from thriving in the RSI system?
- Question 13: Do you agree that excellence must be seen in a global context, and draw from the best technology, people, and ideas internationally? Why or why not?
- Question 14: Do you agree that excellence is strengthened by stronger connections?

- Question 11. Excellence definition,
 - A broad definition of research excellence is needed by the science sector to enhance diversity, global outlook and partnership. We support the definition in the Strategy document.
 - Implementing this will require new and broader metrics of excellence, which
 need to be shared across the science sector to drive changes. Panels need to
 include people who recognised and can score the breadth of research
 excellence panel diversity will need to be increased in some sectors.
- Question 12. Diversity within the workforce.
 - To address NZ's biggest science questions and inequities, diversity is needed, particularly more Māori researchers.
 - NZ needs to create more opportunities for the Asian, Pacific, Indian and immigrant people in NZ to contribute to the research workforce.
 - NZ also needs global diversity in its workforce to address global problems and possible solutions.
 - O Application of different knowledge systems and perspectives will enhance the impact of science. In NZ, all scientists need to value and have a basic understanding of Te Ao Māori to understand how it may apply to their research field. Historically in some fields when selecting Scholars, Fellows and Faculty, international excellence is highly valued and knowledge and application of Te Ao Māori has not be considered at all. Science leaders and decision makers need to be trained to recognise biases. The responsibility to address this inequity falls on non-Māori leaders as well as Māori leaders.
 - Stronger VM requirements are needed to reduce inequities and facilitate change in the science sector. To understand the science sector response, VM needs to be measured and reported for every grant application.
 - Barriers for Māori researchers can be reduced by including:
 - More scholarships, from Honours through to PhD students. Assessment needs to include Te Ao Māori knowledge and evidence that the applicant's embody Māori principles, as well as having an academic record and support network that will enable success.
 - Drivers to facilitate change in the science sector. These may include equity driven weighting of Māori applicants in the PBRF assessment

process, scoring of VM sections in grants, and reporting of VM progress throughout the funded period. These drivers will reinforce the important and unique contributions Māori researchers bring to the science sector. These drivers will enable Māori researchers to thrive and stay in the science sector.

- Question 13. Excellence in a global context.
 - A global context is critical but should be balanced with excellence in the NZ context, what is needed to strategically grow the science sector and/or will address NZ's key challenges for growth, health and wellbeing. The balance should be considered across specialties within the sector. It is also possible, that global versus NZ contexts may differ across specialties.
- Question 14. Excellence is strengthened by stronger connections.
 - Yes, stronger connections create the meaningful and critical discussions needed to significantly advance techniques or the field, by learning from other specialties.

Guiding Policy - Impact

Question 15: How can we improve the way we measure the impact of research?

Please type your submission below.

- Question 15. Improving measurement of research impact.
 - Impact should be measured holistically across and beyond the science sector.
 Impact should measure the number of publications and journal impact values, plus how often an article is cited, the quality of journals it is cited in.
 - Broader metrics should also be used. For example, have data been used as
 evidence for policy changes, redistribution of research or other funding (e.g.
 DHB priorities), changes in practice (e.g. increase building standards for health
 and wellbeing) and changes in behaviour (e.g. encouraging people to talk more
 to strengthening communities and improve connectedness), this needs to be
 valued as impact by the science sector.
 - Dissemination of information needs to be more diverse and detailed. Are messages being shared outside academia? Are messages shared with stakeholders and end users? Are researchers disseminating to diverse communities? Are different methods of dissemination being used, such as pūrākau/storytelling, in a play or a movie? Are the media conveying research messages? These non-traditional forms of science dissemination can more impactfully change behaviours.
 - Alongside this, grant assessment committees need to (1) include a member who
 has evidence of broad impactful dissemination methods to provide this
 expertise and/or (2) provide training for committee members to identify when
 dissemination has been broad and had impact.

Guiding Policy – Connections

- Question 16: Where do you think weak connections currently exist, and what are the barriers to connections at present?
- Question 17: What actions will stimulate more connectivity between parts of the RSI system?
- Question 18: How could we improve connections between people within the RSI system and people outside it, including users of innovation, and international experts, business communities, and markets?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

- Question 16. Weak connections and barriers.
 - Researchers continue to work in silos, which is not always productive.
 - Current PBRF system rewards competition between universities and academics resulting in less, rather than more, collaboration and connections.
 - Time to engage can be difficult with increasing workloads and pressures in academia and other sectors.
 - Sometimes geographical barriers slow progress. However, commitment to achieve outcomes and work effectively usually overcomes these barriers.
- Question 17. Actions that stimulate more connectivity in the RSI system.
 - Include evidence of collaboration and shared infrastructure as part of PBRF
- Question 18. Improving connections within and outside the RSI system.

Funded tours like FRIENZ could improve connections particularly if there was funding (or co-funding) for collaborations coming from international visits.

Actions - Making New Zealand a Magnet for Talent

- Question 19: How can we better nurture and grow emerging researchers within New Zealand and offer stable career pathways to retain young talent in New Zealand?
- Question 20: How could we attract people with unique skills and experience from overseas to New Zealand?
- Question 21: What changes could be made to support career stability for researchers in New Zealand? What would be the advantages and disadvantages of these approaches?
- Question 22: Do you agree with the initiatives proposed in the Strategy to support and attract talented researchers and innovators? Are any changes needed for these initiatives to be successful? Are there any other initiatives needed to achieve these objectives?

- Question 19. Grow emerging researchers.
 - We need to grow emerging researchers from within NZ and attract talent to NZ.
 - To enhance the emerging researchers reputation and networks on the international stage, they should spend some time overseas gaining new skills and experience. This may be achieved by 3-12 month periods working in another team and learning how other science systems work.
 - Offering some stability during the early-mid career structure is critical for retaining the best talent. It is also critical for increasing the diversity of researchers. Māori FRST scholarships and fellowships in the late 1990s (Tūāpapa Pūtaiao Māori Fellowships) significantly increased the number of Māori PhD scholars, many of whom remain in the sector (statistics can be provided by Rauika Māngai Māori Directors of the National Science Challenges).
- Question 20. Attract people with unique skills.
 - This strategy has prevailed in the past, but has been achieved ad-hoc. Attracting new talent needs to be achieved more strategically within the sector.
 - Assure that overseas recruits are promoted and hold leadership positions to the same extent as NZ and Commonwealth born and educated people.
 - Address gender inequities.
 - A gaps analysis should be done to characterise what skills in which specialties are really needed. Once gaps have been detailed, an approach that could be used to increase diversity and retain local Māori and Pacific talent is to invest training in local researchers with relevant backgrounds. Here, a NZ researcher could be supported to learn a new technique or analysis from a world expert overseas and then establish that in NZ.
 - Attracting NZ talent back is another strategic approach that should be adopted.
 Fellowships could be used to support more senior postdoctoral fellows to come back to NZ in a staged process (1 or 2 further years overseas before a planned move back to a NZ University/Institute for 2-3 years all of this would be documented in the grant application), similar to the K99 Fellowships at the

National Institutes of Health in the United States that are used to transition early career researchers into independent careers.

https://researchtraining.nih.gov/programs/career-development/k99-r00

- Question 21. Support career stability in NZ.
 - See questions 19 and 20. Investing in local talent, where possible, will improve career stability.
- Question 22. Agree with the initiatives in the Strategy?
 - NZTE and Callaghan Innovation facilitate business support systems. This appears to be focused at the business end of the relationship.
 - Does Callaghan help researchers understand the business context and environment, i.e. facilitate knowledge transfer in the other direction.
 - Currently, the business part of the RSI system is perceived to be weak. To
 address this, should scientists be supported to transition towards or into the
 business part of the science sector? One approach is for people with science
 PhDs to be supported to complete MBAs.

Actions – Connecting Research and Innovation

- Question 23: What elements will initiatives to strengthen connections between participants in the RSI system need to be successful?
- Question 24: What elements will initiatives to strengthen connections between participants in the RSI system and users of innovation need to be successful?
- Question 25: What elements will initiatives to strengthen connections between participants in the RSI system and international experts, business communities, and markets need to be successful?
- Question 26: Are there any themes, in addition to those proposed in the Strategy (research commercialisation and international connections), that we need to take into consideration?

- Question 25. Elements ... RSI and users of innovation, international experts, business communities.
 - A much larger investment is needed for NZ researchers to collaborate internationally. Particularly in Australia, Singapore (initially) and then Taiwan, Japan, and South Korea.
- Question 26. Themes.
 - Populations.

Actions - Start-up

Question 27: How can we better support the growth of start-ups?

Question 28: Do the initiatives proposed in the draft Strategy to support growth of start-

ups need to be changed? Are there any other initiatives needed to support

start-ups?

Question 29: What additional barriers, including regulatory barriers, exist that prevent

start-ups and other businesses from conducting research and innovation?

Actions - Innovating for the public good

Question 30: How can we better support innovation for the public good?

Question 31: What public-good opportunities should our initiatives in this area be focused on?

- Question 30. Innovation for public good.
 - Engage the public and stakeholders on what "public good and innovative solutions" means to them.
 - o Capture and address rural and urban views.
- Question 31. What opportunities to focus on?
 - O See question 30.

Actions - Scale up

Question 32: What is the best way to build scale in focused areas?

Question 33: Do the initiatives proposed in the Strategy to build scale in focused areas need to be changed? Are there any other initiatives needed to build scale?

Note: see following page to comment on possible areas of focus

- Question 32. Scale up.
 - Why put money and resources into developing a space industry? These are well advanced in other countries and will divert funding away from more pressing areas of renewable energy and delivery of health services (via technology-see next point)
 - Health technology to improve health services delivery may improve access for some, but not all, of the NZ public. There is a risk of increasing inequities and this needs to be carefully managed.
- Question 33. Change of focus for scale up.
 - See comment above about focus on space industry. "Space junk" is a significant and growing problem as more countries develop a space industry. Does NZ really want to contribute to this problem?

Scale up - Choosing our areas of focus

For this draft iteration of the strategy, we seek input on the selection of possible areas of focus. We will consider establishing around five focus areas, but, depending on the eventual selection, are likely to introduce them over time, rather than immediately. In addition to the criteria set out in the Strategy document, we invite stakeholders to consider the following factors in their suggestions —

- The ambition of this strategy to focus efforts in the RSI portfolio at the global frontier of knowledge and innovation.
- Ways in which the RSI system can accelerate progress on the government's goals
- The focus areas already determined by From the Knowledge Wave to the Digital Age.
- Work already underway where we are already seeking to build depth and scale in the RSI system.

The following areas could be a useful start, and are highlighted in From the Knowledge Wave to the Digital Age:

- Aerospace, including both autonomous vehicles and our growing space industry.
- Renewable energy, building on recent investments in the Advanced Energy Technology Platform.
- Health technologies to improve delivery of health services and explore opportunities in digital data-driven social and health research.

We invite comment on these suggestions and welcome input on other possible focus areas.

riease type your submission below.				

Actions – Towards an Extended Vision Mātauranga

This section of the draft Strategy signals our intention to consult and collaborate further with Māori stakeholders to co-design our responses and initiatives. From that perspective, we consider the signals in the draft Strategy to be a start, rather than a set of final decisions. Nonetheless, we are keen on initial feedback in the following areas.

- Question 34: Does our suggested approach to extending Vision Mātauranga focus in the right five areas? If not, where should it focus?
- Question 35: How can we ensure the RSI system is open to the best Maori thinkers and researchers?
- Question 36: How can we ensure that Māori knowledge, culture, and worldviews are integrated throughout our RSI system?
- Question 37: How can we strengthen connections between the RSI system and Māori businesses and enterprises?

- Question 34. Extending Vision Matauranga.
 - The Strategy states that the Vision Mātauranga extension will be codesigned with Māori. The extension needs to be framed in the context of partnership obligations under the Te Tiriti o Waitangi. Power and resourcing should be equitably shared.
 - It is critical that all researchers increase their knowledge and understanding of Mātauranga Māori a sector shift is needed. Everyone is responsible for producing the shift. It is also critical that leaders and decision makers understand biases and implement processes that minimise biases influencing outcomes (funding and appointments etc).
 - Vision Mātauranga knowledge is synonymous with research excellence in NZ.
 The definition of research excellence and how it is measured is critical.
- Question 35. Is the RSI system open to the best Māori thinkers?
 - Some parts of the RSI system, such as National Science Challenges, allow Māori thinkers and researchers to be successful as Māori. In other sectors, Māori researchers face barriers, burdens and systemic racism, therefore, cannot flourish and often exit the sector.
 - O Many Māori researchers are the sole Indigenous researcher in the team, Department and School making them vulnerable. Other people can relate and extrapolate this point to their own distinct culture and identity. However, it is critical to remember the unique Treaty position that Māori hold as partners with the Crown. Māori should not feel marginalised and isolated within NZ. The size of the problem has not been documented in terms of frequency, extent and seriousness of these barriers to success. Until this happens, system minimises the issue and delays implementing solutions.
- Question 36. Integrating Te Ao Māori throughout the RSI system.
 - It is important for Māori researchers to feel valued in the sector. A critical mass is needed in all fields. Messaging needs to be consistent - Māori spaces are

needed and time allowed for whānaungatanga and tikanga. If this does not occur, Māori are expected to flourish in suboptimal environments.

- Question 37. Strengthen connection RSI, Māori businesses and enterprises.
 - Māori economies currently make up 6% of the NZ's GDP. Enhancing links between Māori researchers, RSI system, Māori businesses and enterprises is logical and should produce profitable outcomes for NZ.

https://www.tpk.govt.nz > download > met-rep-assetbaseincexpend-2011

Actions – Building Firm Foundations

Question 38: Do the current structures, funding, and policies encourage public research organisations to form a coordinated, dynamic network of research across the horizons of research and innovation? What changes might be made?

Question 39: Is the CRI operating model appropriately designed to support dynamic, connected institutions and leading edge research? What changes might be made?

Question 40: What additional research and innovation infrastructure is necessary to achieve the goals of this Strategy? What opportunities are there to share infrastructure across institutions or with international partners?

Question 41: What elements will initiatives in this area need to be successful?

- Question 38. Current structures, funding and policies.
 - The National Science Challenge models work quite well as coordinated, dynamic networks of research. More funding to the NSC would increase ability to widen these networks.
- Question 39. CRI operating model.
 - A review of PBRF is needed. Currently it does not support research connectivity.
- Question 40. Additional infrastructure needed.
 - A significant investment will be needed in order to share infrastructure nationally and internationally. The RSI would need to be willing to invest in shared resources in equal/equivalent amounts to make it attractive, particularly to international partners.
- Question 41. Elements needed for success.
 - Start with building connections, both nationally and internationally.

Actions - General

Question 42: How should the Government prioritise the areas of action, and the initiatives proposed under each area?

Please type your submission below.

 Building firm foundations through increased funding needs to come first, then extended VM, followed by connecting research and innovation particularly improving international connections. This will lead to NZ becoming a magnet for talent and "start up- scale up"



General

Question 43: Do you have any other comments on the Strategy which have not yet been addressed?

Please type your submission below.

- RSI sector contributions. Government connections in RSI pp12-13. Which funds are
 exempt from the collaborative approach? Some key funders are not mentioned in this
 section, which makes it confusing where they fit in these activities e.g. Endeavour
 Fund, Marsden Fund, National Science Challenges etc.
 - The definition of research institutions has a narrow focus on p14. Wānanga and Polytechnics are increasingly research active. Wānanga will significantly contribute to Mātauranga Māori research and should be included in the institution definition or aligned in the extended Vision Mātauranga Māori section.
 - Tracking and measuring research success would be easier for all funding agencies if researchers engaged in ORCID – unique research identifier numbers.
 - In addition, impact could be more easily tracked if NZ grants had a consistent identifying system that had to be included on every publication, citation for policy, public engagement, talk etc.
 - Annex 2 Indicators of Success- Starting with building the connections both nationally and in particular, internationally, will lead onto success with excellence and impact.

