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Te Ara Paerangi Future Pathways Green Paper

Te Herenga Waka – Victoria University of Wellington – submission to the Ministry of Business, Innovation and Employment

Thank you for the opportunity to engage on this potentially transformational change in the research, science and innovation system. We have worked across Te Herenga Waka – Victoria University of Wellington to seek the views and perspectives from the different disciplines and parts the University to form our response. The views set out in the paper reflect feedback from nine workshop sessions encompassing early career researchers through to our senior leaders. We have also encouraged all those at the University to provide you with their own perspectives as individuals, teams, Faculties and Schools, and disciplines.

Introduction

We support the need for significant reform of the Aotearoa New Zealand research, science and innovation system as outlined in the Te Ara Paerangi Future Pathways Green Paper and recognise the challenges and the level of investment needed to bring about this kind of system-level change.

It is critical that Aotearoa New Zealand takes this opportunity to design a coherent and integrated research system, that embeds Te Tiriti o Waitangi as its foundation and establishes a new way of operating. The creation of a framework that is based in robust system-design thinking and approach will support these changes, while helping to ensure new policies, initiatives and schemes align to the outcomes we are seeking.

What else do we need to focus on?

The Green Paper identified many of the critical issues in the current research system. However, there are gaps that must be addressed before the Future Pathways programme progresses to the next stage. These are set out below.

- The importance of Pasifika research and Pasifika researchers is entirely absent from the Green Paper discussion. The critical role that Pasifika researchers play in our system, the importance of Pacific communities in Aotearoa, and our strong and vital connections with Pacific nations along with our role in the Pacific, are essential to the discussion on achieving a diverse, equitable and inclusive research system.
- The importance of international connections and the role Aotearoa New Zealand plays in the global research environment is also absent. The flow of research and researchers both into and out of our research environment is a critical part of sustaining an active and sustainable system. We recognise that taxpayer funded research should bring benefits to Aotearoa New Zealand, however, we are a small nation and benefits can be achieved in many ways. We must take advantage of international

research opportunities and be a part of the solution to globalised challenges and bring international capability and connections here to ensure we benefit from a diversity of skills and capabilities. This will bring greater benefits than a research system primarily focused on domestic outcomes and impacts.

- The discussion in the Green Paper focused heavily on the 'science' system, rather than the broader research environment. While we understand from the workshops that this was not the intention, there was very limited discussion on the social sciences, arts, and humanities within the Green Paper. These are parts of the system that contribute significantly to research and innovation, driving excellence in practice-based and creative research, and leading the world in indigenous research paradigms, while also receiving the least resource from the current research system. As a nation and globally, we are facing grand challenges – tackling climate change, transitioning to a low carbon economy, dealing with threats to biodiversity, biosecurity and food safety, developing sustainable cities, improving wellbeing by ending homelessness and family and care environment violence, and harnessing technology for cyber security and social good, among others. The human dimension of these issues is critical and requires a multi-disciplinary approach to find solutions. Significant dedicated investment in social sciences and humanities capability is essential for us to achieve positive outcomes for Aotearoa New Zealand.

What does a future research system look like?

Our vision of the future of Aotearoa New Zealand's research system is long-term, ambitious, interdisciplinary, cross-sectoral, porous, equitable, diverse, inclusive, collaborative, engaged, impactful, Treaty-based, agile, responsive, connected, purposeful, and co-creative.

When we think of the research system we think of the broad range of organisations and people who do research. The future research system will be better off by encouraging and supporting research that is done across the environment; from research-intensive organisations like universities, redesigned Crown Research Institutes, and independent research organisations through to spin-offs, industry, community groups, health sector, and other organisations where research takes place.

The future research system needs to:

- Be underpinned by Te Tiriti o Waitangi / the Treaty of Waitangi; embedding Te Tiriti principles throughout its design and operation, actively enable and support Māori-led partnerships, valuing and supporting mātauranga Māori and Māori researchers, and removing barriers to leadership, participation and engagement.
- Be deliberately designed to support and sustain long-term research that delivers public good and responds to both longer-term strategic priorities and emerging needs of Aotearoa New Zealand.
- Sustain, cultivate and develop the skills, capability and capacity of the research workforce to ensure the agility and responsiveness of the system.
- Enable active collaboration with, and movement across, all organisations delivering and using research in a way that fosters interdisciplinary and cross-sectoral research and career pathways.
- Create equity across the disciplinary areas through appropriate mechanisms that balance strategic longer-term funding and responsive competitive funding.
- Support and sustain diverse and skilled workforce capability, recognise the value of early career researchers, and support pathways within and outside of academia and across different research environments.
- Support the spectrum of research disciplines and activities, along with the tools and infrastructure needed to deliver quality research.
- Actively recognise, encourage, and support sustained engagement and partnerships with users of research which foster social, environmental, and public good outcomes, and increase investment and support from end-users, industries, businesses.
- Develop priorities in an open and transparent way, that is independent but inclusive of perspectives from institutions (including researchers), iwi, government, and industry.

- Coherently bring together and align strategic research policies and outcomes, funding, and other resources from different parts of the public sector (e.g., education, health, primary sector), and maintaining this across successive governments.
- Encourage and support private sector investment in research and development.
- Provide a regulatory system that enables appropriate access to research to support research mobilisation leading to research uptake and utilisation to create impact.
- Provide career pathways that enables New Zealand to grow, foster, attract and retain the talented research workforce required to address strategic priorities and emerging needs of Aotearoa New Zealand.

Themes

Research Priorities

We agree a more open, transparent, deliberate and coordinated priority-setting process that gains input from a broad range of stakeholders is critical for the future research system. The current priority decision-making processes make decisions which effect the entire system, with limited visibility, input from stakeholders, or clear evidence to support these decisions.

A future research system must draw directly and hold the principles of Te Tiriti o Waitangi at the core of decision-making and action around priorities that system puts in place. The submission by Toihuarewa provides a more expansive view on this critical area, which will ensure more attention is given to Māori needs and aspirations than is currently the case.

Research priorities can be strong drivers that direct the work of organisations and individuals, with the benefit of providing some certainty of a future direction but having the ability to adapt quickly to emerging needs. A future research system needs to recognise this in terms of how research priorities are designed. It is also critical that the priority setting process doesn't create significant disincentives for undertaking certain types of research or research areas. Blue skies research is an essential part of the system which needs to be recognised and supported but should not come under a priority-setting commission.

There are benefits in having a stratified approach to priority setting. Having a body that identifies broad long-term strategic priorities that have domestic and global significance (e.g., climate change, biosecurity and biodiversity, equity, diversity, and inclusion, etc.) while enabling other research bodies to respond with specific priorities and develop the strategic plans and initiatives would provide flexibility and agility to the system. The Canada Research Coordinating Committee provides an example of central development of national research priorities and the coordination of policies and programmes with the next 'layer' of research funding agencies can work together.

A priority-setting body needs to bring together government, iwi, industry, and research communities in a meaningful way in the new system. Previously there has been a focus on top-down priority setting by government, however in a Te Tiriti-centred system there must be an equal partnership between the Crown and Māori. The recommendations in the 2021 Te Pūtahitanga report need to be a part of the discussion, especially the recommendation to establish a Mātauranga Māori Commission that provides leadership over Māori knowledge priorities.[1]

There is also significant expertise outside of government that can be effectively utilised to establish future-focused priorities for research. The system-level change that is being sought requires a diversity of perspectives, a balance in the way of setting priorities, and significant buy-in from Government to achieve longevity and sustainability. The Finnish Research and Innovation Council and the Swedish National Innovation Council are both models that bring critical stakeholders together with the councils chaired by their respective Prime Ministers. Another example is the Dutch Research Agenda (NWA). This is the result of an innovative approach to developing priorities for research and innovation that brings the public and scientists together. The goal of strengthening the connection between science and society is carried through the

[1] Te Pūtahitanga: A Tiriti–led science-policy approach for Aotearoa New Zealand, Tahu Kukutai, Tracey McIntosh, Amohia Boulton, Meihana Durie, Meika Foster, Jessica Hutchings, Melanie Mark-Shadbolt, Helen Moewaka Barnes, Te Taiawatea Moko-Mead, Sarah-Jane Paine, Suzanne Pitama, and Jacinta Ruru, 2021.

implementation of the NWA, for example, consortia of researchers and partners from the public, semi-public and private sectors work together intensively in designing, realising and applying research to address complex issues.

A research commission for Aotearoa New Zealand

The concept of a specialist independent research commission (referred as a council in their submission) has been proposed by Universities New Zealand. This could be beneficial if the focus was supporting the long-term strategic outcomes for Aotearoa New Zealand, rather than responding directly or solely to government as with the previous Foundation of Research, Science and Technology.

Independence and transparency are critical. While government involvement in priority setting is important, research priorities need to extend beyond the length of parliamentary terms of governments and interests of individual Ministers.

The role of a New Zealand research commission would need to be well defined. A clear problem definition of the current issues around priority-setting would be beneficial for this purpose. The Green Paper sets out several issues which a research commission could help resolve, we think that having a centralised body to develop and operationalise a research infrastructure management plan and take a coordinated strategic approach to capability development would be key among those.

The structure of the Canada Research Coordinating Committee and the associated research councils should be considered as a model as it brings together the different aspects of strategic priorities, funding, capability development, and horizon scanning. The Australian Research Data Commons (ARDC) model for national research infrastructure management should also be considered. The model provides central leadership of research infrastructure, skills and partnerships, which align to the essential elements of the future research system.

Te Tiriti, Mātauranga Māori, and Māori Aspirations

Te Herenga Waka endorses the response submitted by Toihuarewa as the appropriate forum for Māori academics to provide their perspectives on Te Ara Paerangi Future Pathways.

The Toihuarewa submission addresses the questions raised in the Te Ara Paerangi Future Pathways Green paper and future research needs to embed Te Tiriti throughout its design and operation to ensure that the principles of kāwanatanga, rangatiratanga, and ōritetanga are enacted and given effect.[2] There needs to be real change in the system, with autonomy and resourcing to make the decisions and take the actions needed to support mātauranga Māori in all its forms and support the Māori research workforce.

Funding

The new research system needs to invest in capability and capacity of researchers. It must also provide funding for the spectrum of research, have a multi-disciplinary focus, and fund the collaboration and engagement activities critical to knowledge translation. Significant new investment is required to support the system-level change sought from the Green Paper, and while this is touched on, consideration needs to be given to what level of change can reasonably be sought without any additional investment.

The future funding system needs to redress the Te Tiriti o Waitangi gap and core inequities through more equitable funding opportunities. The proposal for an independent Māori research entity, with its own based funding, and capacity to support the diverse range of Māori research and researchers across the sector as outlined in the Toihuarewa submission would be a critical step to addressing the current inequity. This could also support actions on the recommendations set out in the 2021 report Te Pūtahitanga: a Tiriti–led science-policy approach for Aotearoa New Zealand from Ngā Pae o te Māramatanga.

[2] See staff submission "Bringing Te Tiriti o Waitangi to Life within the RSI Sector" for ideas on how this could work.

Building capability and capacity for the future

The future research system needs to be responsive and agile. This will allow us to respond to both known grand challenges and emerging threats and opportunities. One of the critical elements of this is ensuring we have the capability to adapt and the capacity to respond. This means the system needs to provide sufficient investment across the disciplines and organisations to ensure that the research workforce can be pulled together to address medium-term issues and crisis events. The COVID-19 pandemic, the Whakaari/White Island eruption, and other events have shown we can do this but at the expense of other priorities. A system that supports spare, or non-business-critical, capacity, and a wider range of skills and capabilities (including technical and research support workers as well as researchers) will ensure our research environment is robust, sustainable and agile.

A coordinated, strategic approach to capability development across the system is essential to achieving this goal and having funding that supports this is critical. Creating funding streams with specific purposes – to build capability and to support strategic priorities - need to be part of the funding system. Infrastructure funding would also benefit from a coordinated and strategic approach to ensure that critical resources support the capability of the research workforce (as identified in the ARDC model).

A fund that supports a broad range of research activity, provides support across all disciplines, and is designed to support the capability of the workforce across the different types of research organisations is essential in the future funding system. Capability funding that focuses on achieving the greatest benefits outside of the strategic priorities creates opportunities for innovative, ambitious, and bright ideas to be appropriately supported, alongside growing and retaining a broad base of capability across disciplines. The Canadian research funding councils (NSERC, SSRHC and CIHR) are good examples of this type of capability funding.

The research system should also be supported by organisations with a specific capability focus; for example, Crown entities to replace the CRIs with the remit to deliver public good without commercial imperatives that deliver the capability and supporting the infrastructure for all of Aotearoa New Zealand would be a significant step forward.

Funding that is directly aligned to strategic priorities is the other critical part of the funding system to be addressed. A strategic research fund needs to support long-term, priority-linked, or transformational research platforms identified by our priority setting body and implemented through the associated research organisations. This approach would enable us to appropriately support our grand challenges, be they local or global, increase the utilisation of the research undertaken, incentivise long-timescale partnerships and collaborations, and support on-going capability development and retention of a skilled, experienced research workforce.

Consideration of how aspects of the National Institutes of Health model in the United Kingdom, which links industry with research and through NIH and NIHR Applied Research Collaborations (ARCs) supports longer-term research, could be incorporated into our future funding system to achieve better outcomes. If we consider our current system, the National Science Challenges and the Strategic Science Investment Fund should be combined into a long-term strategic funding pool that supports top-down priorities, with significant additional funding incorporated into this.

This approach would ensure there is a set of funds that encourage the research community to suggest new, innovative, or blue skies ideas, alongside the long-term strategic funds supporting top-down priority research. Incorporating mechanisms to identify and transition projects or programmes with potential into a strategic fund, would ensure the full utilisation of the research, maintain capability, and strengthen the research system.

Supporting multi-disciplinary research

The future research system needs to place significantly more emphasis on multi-disciplinary research. The Canadian research system has a relatively equitable split of funding allocated by the government, with social

sciences and humanities receiving roughly the same funding as natural science and engineering, and health and NZ's future research funding system should do the same.[3]

A social sciences research committee with dedicated funding would be a significant step forward for Aotearoa New Zealand. The current support of social sciences, humanities, and creative arts for both research and capability funding are extremely limited. This limits the extent to which truly multi-disciplinary research can flourish. Ensuring that investments support research right across the system is also critical. Investing in research being undertaken in communities, industry and spin-offs will allow New Zealand to benefit from the full range of innovative, creative, impactful ideas and outcomes our researchers produce.

Base grants and full-cost funding

Support for the concept of base grants is mixed. How these could potentially operate is reliant on the specific problem to be solved. There are many issues outlined in the Green Paper, but it would be impossible for a base grant model to address all of these. While there is the potential for a base grant to provide a level of stability for business-as-usual research by funding overheads or support capability (and potentially reduce precarity) by funding salaries, the design options come back to the problem that it is aiming to solve.

The funding of overheads could be a pragmatic way forward, and we would recommend undertaking work across all research organisations to determine internal costings as an evidence-base for a potential formula. There would also need to be clear benefits in moving to this model, as the baseline funding model used in the United Kingdom is complex, carries a high administrative burden for universities, and usually meets ≈80 percent of costs so it is not a full-costs model.

Supporting engagement, collaboration and communication

A future funding system need to actively support engagement with users of research, and collaboration across research organisations, industry, iwi, and communities. This is critical work in most research, but in a Te Tiriti-centred research system, building authentic and sustainable partnerships and relationships with iwi, Pacific communities and industry is critical. This needs to be recognised in the funding system if we want to address the current issue of superficial engagement and collaboration with our research partners that starts and ends with the funding cycle.

There is also a gap in regard to our international collaborations. More active participation by Government to establish cross-Australasia-Pacific initiatives similar to the models within the European Union, would be beneficial to the long-term future of our research system. We acknowledge that establishing cross-research programmes and funding are difficult, a more proactive and strategic approach could enable us to be where we need to be in the future.

The utilisation of our research is heavily dependent on how effectively we undertake knowledge transfer. Supporting activities including research communication and outreach, along with making open access to research, would make a significant difference to research being taken up by end users. The importance of this is recognised in the Dutch Research Agenda which has a targeted programme stream which aims to make science accessible for a wide audience and give back research results to society.

Institutions

The future research system must facilitate research connectivity regardless of the type of organisation, with researchers able to move seamlessly across and between organisations, gaining skills and expertise that benefits the broader system.

We support greater collaboration between Universities and Crown Research Institutes (CRIs) and increasing collaborative partnerships across the spectrum of research providers. We would welcome more opportunities

[3] In 2021, the Social Sciences and Humanities Research Council received $1.463 billion, the Natural Sciences and Engineering Research Council received $1.493 billion, and the Canadian Institutes of Health Research received $1.619 billion.

for co-location as physical connections can help foster the research culture, create efficiencies in terms of shared facilities, and support the development of capability and capacity of the research workforce.

A move away from the company model for CRIs, as well as a shift away from a sector-based model, would have significant benefits for a future research system. This part of the system should lean far more heavily into public good research for Aotearoa New Zealand, build critical capability, build stronger connections and partnerships, and be more strategic and forward looking. The Fraunhofer model in Germany should be considered as an exemplar for the shifts we seek to make to this part of our research system. This model highlights the potential for flexibility which our current system lacks. It provides a way for pulling together mission-focused research in a way that isn't permanent but can be dissolved and reformed as needed. This could be an effective way for us to respond to medium-term research needs. There are huge opportunities to align with other changes, especially the new health reforms, to ensure that research is at the forefront by bringing together resources and capability to create critical mass in thematic areas. This would be beneficial for all research organisations. The Fraunhofer model, with the focus on effective knowledge transfer, innovation and excellence, and future technologies, also represents the type of step forward that is needed in New Zealand.

Research Workforce

The research system is primarily its people – researchers and those who support research are the backbone of the current and future system and investment is critical. The future research system needs to be a place that people choose to become a part of, and this means significant change is required.

We agree with the workforce issues identified in the Green Paper; equity, diversity and inclusion, career precarity for early career researchers, RSI education pipeline, movements within the research system, and international connections.

The research workforce must be one of the strategic priorities of the future research system if we want to address these issues. This includes strengthening the pathways from secondary and tertiary education into the research workforce, ensuring our research students gain a broad range of skills, knowledge and expertise through their training, creating porous, varied and inclusive career pathways (the braided river analogy) through intentionally designed professional and career development, and valuing and supporting early career researchers through appropriate funding mechanisms, career support and employment mechanisms. What we design now in terms of the research system, is the environment our early career researchers will own so their voices in this process are critical.

Growing capacity and capability

Education is a key aspect of the pathway that feeds into both research and wider society, so further discussion around the issues of teaching and training is needed including ways of strengthening the connections between secondary and tertiary education. Stronger connections between teaching and research can support the development of our wider research workforce and increase the quantum of Māori and Pacific researchers, while building Te Ao Māori into the training and development of our research workforce will help embed Te Tiriti at a systems-level.

We also need to consider the training of our future researchers. For example, we need to question whether the structure of PhDs have appropriately diverse avenues to bring a wider range of people into research and provide the right skills and competencies to encourage mobility across the research environment. Despite the growing scarcity and precarity of post-doctoral roles here and overseas, there continues to be lower uptake of professional applied research degrees which indicates a clear issue to be addressed.

The capability and capacity of professional staff that support research and research infrastructure need to be part of the strategic planning for the workforce and infrastructure. This is discussed further in the section on Research Infrastructure.

Equity, diversity and inclusion and the impact of precarity

Any design of a future funding system needs to address institutional barriers for inclusion, and subsequent precarity, for Māori, Pacific peoples, and women. While new funding mechanisms have some potential to address these issues, specific funding initiatives for post-doctoral roles that are time limited (i.e., fellowships) do little to resolve these issues or the issues relating to limited career pathways and growing a diverse, sustainable research environment. Post-doctoral schemes, internships, or placements that are part of large, long term, mission-led strategic programmes allow early career researchers to see a 10–15-year horizon and create a career development pathway. A model like the UK CASE funding which provides for collaboration with non-academic partners from the private, public and civil sectors could be an effective model here. There is also a significant role for organisations, especially larger research institutions, to ensure that there are processes in place that convert fixed-term to permanent roles, and short-term to long-term roles.

A research system that provides both the skills and opportunities to undertake research in different ways and in different organisations would do more to support the long-term reduction of a precariat workforce. It would also be a significant step to ensure our homegrown talent is able and willing to stay in Aotearoa New Zealand, while providing an attractive option to bring overseas talent here.

Research Infrastructure

There is a clear need for a centralised, national infrastructure management plan, with an associated strategic infrastructure scheme. The design of the future research system must ensure that infrastructure is fully and effectively utilised, and that there is investment in technical resources to both establish and maintain large strategic shared facilities, collections and databases, and other tools and technology critical to undertaking research across the disciplines, Taking a national approach to critical issues including open access, research data management and the curation and publication and research data, would allow us as a country to review our infrastructure and the approaches we take to support, maintenance and investment.

We think that steps need to be taken to support open scholarship and open science through research infrastructure, which the Council of New Zealand University Librarians (CONZUL) submission addresses in more detail. For example, there is considerable merit in developing and implementing Open Access mandates for government funded research outputs. This would align with the policies of other countries and make our research more readily available to potential users.

Co-location of relevant strategic infrastructure with the support of the priority setting body and implemented through the associated research organisations would be extremely beneficial for the system. This would enable the expertise and capability building of the technical and support staff to be wrapped in with broader strategic initiatives for capability development. It would also support and encourage different career pathways and future development opportunities for research students. It would also enable better support for infrastructure that is not within the 'science' system. As noted previously funding opportunities in the arts and humanities are extremely limited, and this is equally the case for infrastructure in these disciplines. Many culturally rich collections and databases built on decades of research are currently at risk, and examples of this include New Zealand Dictionary Centre Database and Theatre Aotearoa. Appropriate funding and support would enable the research community here and overseas to benefit from these rich sources of research data.

The proposed New Zealand research commission and Fraunhofer models noted previously both provide examples of how a centralised infrastructure system could function operationally, however, strategic investment from the government in infrastructure is essential. Government is also a key user of many parts of the infrastructure system, although utilisation of the full range of research by regulators and agencies is low. A national infrastructure plan should also consider how to effectively support connections, partnerships, and collaborations to improve knowledge transfer. If aspects of research infrastructure sat with the users of that research in Government agencies, it would enable better understanding of research findings, increase the uptake and utilisation of the research into policy and regulations, and create additional career pathways for researchers.

Thank you again for the opportunity be a part of the discussion on what we hope will be transformational change to the Aotearoa New Zealand research, science and innovation system. We hope the feedback we have captured from across Te Herenga Waka – Victoria University of Wellington provides you with insights needed to shape our future research system. We look forward to continuing the engagement as you move into the next stages of the Te Ara Paerangi Future Pathways programme.

Sincerely,

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Vice-Provost (Research)