1. Submitter information

1.1 This submission is from the socio-ecological research network based in the School of Environment, University of Auckland.

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1.2 We are happy for our names to be used in association with this submission and to be contacted for further conversation about the contents of the submission

1.3 Our submission builds on 20 years of collaborative research into environment-economy relations, the assemblage of research networks, and university restructuring. We draw in particular on our experience in building socio-ecological knowledge foundations for transitioning towards environmentally and socially just futures.

1.4 We are local and global leaders in developing methodological and conceptual tools to translate altered environment-economy relations into novel land and ocean based biological economies. Since 2000 we have:

- published in excess of 150 papers in international journals and books, and multiple commissioned reports for government and industry agencies
- built and led cross-institutional, interdisciplinary research and social science leadership initiatives in NZ:
  - Building Research Capability in the Social Sciences (BRCSS 2005-2010) (Le Heron et al. 2011; Lewis and Thorns 2005)
  - He Waka Tangata (including Running Hot conferences) (2007-2010) and BRCSS II (2010-2013) (Lewis et al. 2014)
  - Biological Economies (2007-2018) (Le Heron et al. 2016; Pawson 2018)
  - Marine Futures Socio-ecological Knowledge network (2012-15) (Le Heron et al. 2016)
  - Participatory processes for governing environment-economy relations (206-2019) (Le Heron E et al. 2021)
  - Sustainable Seas Blue Economy Theme (SSBE – 2016-2025) (Lewis, N. 2018; Lewis et al. 2020, 2021; Lewis and Le Heron 2022)
- published analyses of successful collective knowledge production initiatives in NZ (Le Heron et al. 2011; Lewis and Le Heron 2022)
- tracked and reviewed key experiments in reforming NZ's research landscapes (Larner & Le Heron 2004; Munro et al. 2010; Lewis and Shore 2017; Lewis and Le Heron 2022).

1.5 Our research has been funded by three Marsden grants, mission-led projects funded by MfE, MRST, TEC, and NZTE, and Sustainable Seas funded projects on blue economy and risk and uncertainty. This work has allowed us to:

- leverage blue skies research to address national priorities and mission-led research to develop novel theoretical insights on environment-economy relations
- foster a globally-recognised marine socio-ecological research network that leverages blue skies social-science to ask novel questions about national research priorities, develops safe and respectful dialogic processes for co-developing research, and encourages productive research exchanges among social scientists, ecologists and mātauranga Māori researchers

2. What do we know from our research

2.1 NZ's future as a prosperous and just nation depends upon resource-based initiatives that work towards realising social and environmental objectives:

a. realising this future requires reworking established environment-economy relations and overturning limits-based growth rationalities and trade-off mentalities
b. NZ's science and research effort is poorly designed for this purpose:
    - tends to separate out environmental, economic, and social research and to treat each as an independent sphere of social action
    - designed to support the status quo rather than deliver the novel thought and experimental action necessary to stimulate, support or evaluate the initiatives required

2.2 Stakeholding processes in research design are non-productive exercises in the exercise of power that encourage narrowly self-interested participation and fundamentally conservative ideas

2.3 Transdisciplinary, mission-led research can sharpen attention on uptake and impact but risks reinforcing business as usual

2.4 Co-development research processes can overcome researcher capture of research trajectories and inattention to impact and uptake, as well as unhelpful technocratic presuppositions about the nature of problems, the questions to be asked and the solutions required

2.5 Lurching too far from disciplinary to transdisciplinary or fundamental to mission-led research, or researcher-led to co-development research processes comes with major risks that threaten to undermine the potential for NZ's short term research effort and long-term research capability:

- restricting the ability to ask deep and uncomfortable questions and frame novel, creative and disruptive answers
- assuming that society already knows the questions it needs to ask and that policy settings and funding agencies are able to translate these effectively into research directions and practice
- introducing perverse outcomes from priority setting and research delivery processes that fail to manage deep conflicts among different world-views and individual and collective interests
- underinvesting in fundamental research and capability building

2.6 NZ might learn much from its own rich but are poorly researched and weakly understood history of experiments in cross-institutional and cross-disciplinary national scale knowledge production, which have:

- provided a foundation for establishing productive social science leadership in developing novel environment-economy research initiatives
- enabled successful cross-fertilisation of fundamental and mission-led research
- mobilised cutting-edge knowledge for impactful, constructively disruptive research for improved environment-economy relations

2.7 Social science has more to offer than is commonly assumed when it is understood in narrowly applied terms. Theoretically grounded, inquisitive, and enactive social research

- exposes the plethora of 'invisibilities' in knowledge, entrenched interests, and conflicting world views that undermine environment-economy decision making
- asks novel and constructively disruptive questions in any research setting
- has dispositions towards experimentation in problem definition and research practice, which bridge gaps between cutting-edge fundamental and mission-led research
- welcomes and enables worldly experimentation and innovative impactful action that enhance economic strategy and decision-making
- produces tools and techniques that enable resource management for transitioning to just outcomes in contests of risk and uncertainty

2.8 The capacity of social science research to deliver on its promise for experimentation and constructive/creative disruption, is being undermined by too tight a focus on policy priorities and related under-investment in fundamental social science, including the administration of the Marsden Fund

3. Research Priorities

We see this Green Paper as representing an opportunity to produce a knowledge production landscape that supports New Zealand to transition to a new period of prosperity based on social and environmental justice.

3.1 Design:

3.1.1 New Zealand's research effort must combine capability-building, fundamental research across the social, biophysical, and bio-chemical sciences and the humanities, with carefully targeted mission-led research.

3.1.2 Fundamental research must be designed, safeguarded, and resourced to maintain NZ's ability to participate in cutting-edge global research, and thus build the capabilities of new generation researchers and enable New Zealand publics to pose and answer the questions necessary to set current and future priorities for mission-led research

3.1.3 The questions of who poses questions about national futures and how they do so are pivotal – New Zealand's capacity to pose and answer the right questions has been boosted in pivotal areas such as Te Tiriti futures, but its weak response to Covid, employment, environmental, and housing crises have demonstrated its research capabilities in other areas require strengthening

3.1.4 Mission-led research priorities must address the interrelationships between global, national, and local challenges

3.1.5 An holistic approach to NZ's research landscape is crucial, but the metaphor of a national science system needs to be rethought

- it is inherently flawed: (a) systems thinking tends to direct unnecessary energies to system design and the impossible task of managing complexity at systems-wide scales; (b) national research efforts are not and cannot and should not be considered as fully plannable, functionally interdependent, or self-correcting
- the metaphor has failed to produce policy that overcomes siloed effort and unnecessary levels of cross-institutional and cross-disciplinary competition

- the use of the metaphor has directed too much resource to administrative and managerial solutions that have introduced new levels of inefficiency, transactions costs perverse behaviour

3.1.6 Metaphors of *knowledge infrastructures* and *knowledge networks* are more robust and potentially productive organisational metaphors for NZ's research effort

- a knowledge network begins with a substantive research focus and proceeds through distributed action and leadership
- a knowledge infrastructure can be understood as a configuration of people, artifacts, funding streams, established practices, organisations, institutions, connections, and purposes/priorities/objectives, which provides stable material foundations for social enterprises such as public good research
- network approaches seek to release rather than suppress the creativity and the energy of complexity (in the case of NZ's research effort, to
- leverage the diversity and strengths of different institutions rather than seek to suppress them beneath systems management approaches
- combine mission-led and fundamental research dimensions productively and creatively in a tightly restricted funding environment

3.2 Setting national research priorities: How should research priorities be set in practice?

3.2.1 The core priority of national research effort must be to sustain, reproduce and enhance the capabilities, including the ability to engage effectively with global knowledge

3.2.2 Setting national research priorities must be guided by identifying opportunities to pose difficult future centred questions without political interference or the undue influence of vested interests

3.2.3 Processes of priority setting must begin by recognising

- that the challenges we face as communities, nation and world are intertwined, complex, chaotic, multiply scaled, and not fully known
- informed and successful interventions require understandings of how real-world relationships are locked into and produced by dynamic tensions
- breaking down the assumptions of NZInc solutions to recognise differences of interest and impact of decisions among different social groups at different scales

3.2.4 Priority setting should progress by:

- highlighting the centrality of *doing economy differently* to all forms of social action and shaping of social futures – it is humanity's core problem (at all scales)
- recognising interrelations (tensions and positively co-constitutive relations) between social, environmental, economic and cultural objectives
- treating social, environmental, and economic futures as entwined, both in terms of processes and outcomes - our research shows that ***we cannot decouple Environment and Economy*** if wish to progress local or national initiatives
- understanding the complex configurations of institutional interests and research commitments and recognising the advantages and disadvantages of specialisation in any specific priority field
- recognising the potential of building connections across institutions and disciplines in network terms

- identifying and responding to long-term social and environmental goals (and treating shorter term economic challenges as means to that end rather than research targets)

3.2.5 Priority setting opportunities to pose difficult future centred questions without political interference or the undue influence of vested interests

3.2.6 Processes of stakeholder participation with research-resourced, community-led, co-learning-based co-development processes that hear diverse voices, air contests and make a diversity of ideas productive, involve Māori partners and a diversity of public interests

3.3 Operationalising research priorities

3.3.1 Avoid one-size fits all solutions to funding or institutional frameworks, but ensure that all sizes are catered for

3.3.2 Recognise the field-specific nature of best management in research ie mix of mission-led and fundamental research, nature of stake-holding, capabilities of co-development partners, nature and scale of research problem, sphere and scale of social objectives

3.3.3 Balance investment in broad institutional forms (Universities, CRIs, private consultancies) for maintaining fundamental science and securing future capability, funded fit-for purpose research networks, and funding platforms that will meet shorter-term priority needs

3.3.4 Secure public-good-focused research capability through ring-fenced core funding of fundamental research functions within universities, and mission-led capability in CRIs

3.3.5 Consider the strengths of NZ-based research networks in priority fields relative to each other, international knowledge production, and the depth and breadth of knowledge required to fulfil the priority need

3.3.6 Consider the value(s) of NZ-based research - is it appropriate to purchase knowledge internationally for adaptation and implementation by domestic expertise

3.3.7 Identify success factors in successful research networks and frameworks: fit-for-purpose approaches, adaptable management, flexibility of objectives, opportunity-based funding streams, field-specific mixes of fundamental and mission-led imperatives and co-development approaches, inclusiveness and openness to Māori and Pacific research engagement etc

- BRCSS was creative/productive because it was constructed equitably across institutions, stimulated opportunities across career stages, assembled cognate disciplines into meaningful research-specific sub-networks, had an organic sense of purpose and ability to structure its operations to serve that purpose, encouraged domestic-international exchanges, enabled exchanges across fundamental and mission-led initiatives, drew in post-graduates and provided a purposeful platform for Māori and Pacific research engagement
- Sustainable Seas has benefited from social science leadership of inter-disciplinary mission-led research; openness to co-development; strong connections to mātauranga Māori research; healthy mix of fundamental and mission-led research

3.3.8 Utilising established success factors, create new field-specific research networks in priority fields where new current and future capability is required - experiment with fit-for-purpose organisational frameworks and institutional forms that will encourage adaptation

3.3.9 Minimise institutional overheads and the management-heavy and low-trust reporting models that tend to emphasise management objectives over research

4. Funding

4.1 Funding arrangements need to follow and support a model of facilitating case-specific effective research networks

4.2 Funding needs to be provided for risky research initiatives and those that challenge the status quo – one problem with the National Science Challenges has been that mission-led approaches have been conflated with a political conservativism associated with stakeholder interests (business and government agencies)

4.3 Funding models for mission-led research must allow for both negotiated funding initiatives and competitively funded initiatives that allow for greater inclusivity and transparency - the core project model of Sustainable Seas is an effective exemplar

4.4 As with organisational design, funding models need to reduce layers of management and unnecessary transactions costs – the costs and distractions of NSCs' multiple layers of management, reporting and administrative requirements to do with co-development and communications represent a cautionary tale

4.5 Funding is required to support fundamental, university-based social research (supported by government funding, the Education Act and commitments to public interest) that will allow publics and government to set and operationalise effective research priorities

- identify, interpret, and respond to the entanglements of social and economic transformation, international and domestic contexts, and the work of ideology and power in mission definition, priority setting, and co-development processes
- prepare publics and government to recognise and minimise the risks to research creativity and future capability from mission-led, co-development approaches (already, for example, the increased interest in transdisciplinary, mission-led and co-developed research signalled in the Green Paper are being adopted enthusiastically but uncritically and translated into dogma and initiatives within universities to reorganise research and teaching)

4.6 The unique and crucial contributions to of university-based, fundamental social science to democratic practice and informing publics and government must be funded – this includes leading debate about research priorities and challenging under-researched enthusiasm for transdisciplinarity and co-developed research

- such enthusiasm, for example, is bound up with, and concentrated by, multiple social, economic, and institutional processes that give it an ideological and institutional force that may overwhelm decision making processes and produce perverse outcomes

- foundational social research positions governmental and economic initiatives such as setting research priorities in the context of social and economic change and the work of power and ideology - resourcing publics to participate meaningfully in setting priorities and co-development processes rather than acting narrowly as stakeholders
- processes such as development and mission-led research require publics to pose penetrating questions such as those to do with fit-for-purpose operational forms

4.7 *The Marsden Fund and its administration needs to be enhanced and shielded from narrow policy priorities* – especially in the social sciences. The Marsden Fund is a vital source of inspiration and funding for the fundamental social research required in New Zealand, yet one that is becoming subjected to policy priorities, especially with respect to social science.

4.8 As with organisational design, funding models need to reduce layers of management and unnecessary transactions costs – the costs and distractions of NSCs' multiple layers of management, reporting and administrative requirements to do with co-development and communications represent a cautionary tale

5. Conclusion

Our primary message is that in our own research we have demonstrated how transdisciplinary and co-developed research can be extraordinarily productive in breaking down siloes and democratising and directing research effort, but that it is crucial to:

5.1 Retain the creative, productive and capability producing strengths of networked, bottom-up, sharply focused research endeavour

5.2 Ensure that co-development processes and transdisciplinary approaches are driven by penetrating questions that come from the edge of disciplinary thought and can only be carried through research processes by the highest quality research capability

5.3 Avoid a swerve towards organising national research effort around priorities, organisational forms and funding arrangements designed to respond to contemporary policy settings and short-term economic challenges

5.4 Protect national research effort from conservativism, rent seeking, and business as usual approaches embedded in stakeholding and established institutional privileges

5.5 Sustain the capacity to transcend policy imperatives, business as usual interpretations of priorities and economic challenges by securing the independence and autonomy of universities and protecting their disciplines, which explore the edges of knowledge

5.6 Avoid the technocratic assumptions that the best research and the best social and environmental outcomes can be driven by policy settings and that today's policy can grasp tomorrow's possibilities and problems

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