#122

COMPLETE

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Page 2: Section 1: submitter contact information

Q1

Name

Jodie Bruning

Q2

Email address

Privacy - 9(2)(a)

Q3 **Yes**

Can MBIE publish your name and contact information with your submission?Confidentiality notice: Responding “no” to this question does not guarantee that we will not release the name and contact information your provided, if any, as we may be required to do so by law. It does mean that we will contact you if we are considering releasing submitter contact information that you have asked that we keep in confidence, and we will take your request for confidentiality into account when making a decision on whether to release it.

Q4 **Yes**

Can MBIE contact you in relation to your submission?

Page 3: Section 2: Submitter information

Q5 **Organisation**

Are you submitting as an individual or on behalf of an organisation?

Page 4: Section 2: Submitter information - individual

Q6 **Respondent skipped this question**

Are you a researcher or scientist?

Q7

Age

Respondent skipped this question

Q8

Gender

Respondent skipped this question

Q9

In which region do you primarily work?

Respondent skipped this question

Q10

Ethnicity

Respondent skipped this question

Page 5: Section 2: Submitter information - individual

Q11

What is your iwi affiliation?

Respondent skipped this question

Page 6: Section 2: Submitter information - individual

Q12

If you wish, please specify to which Pacific ethnicity you identify

Respondent skipped this question

Page 7: Section 2: Submitter information - individual

Q13

What type of organisation do you work for?

Respondent skipped this question

Q14

Is it a Māori-led organisation?

Respondent skipped this question

Q15

Which disciplines are most relevant to your work?

Respondent skipped this question

Q16

What best describes the use of Mātauranga Māori (Māori knowledge) in your work?

Respondent skipped this question

Page 8: Section 2: Submitter information - organisation

Q17

Organisation name

The Soil & Health Association of New Zealand Inc

Q18 Organisation type	**NGO**
Q19 Is it a Māori-led organisation?	**No**
Q20 Where is the headquarters of the organisation?	**Wellington**
Q21 What best describes the use of Mātauranga Māori (Māori knowledge) in your organisation?	**There is a balance between Mātauranga Māori and other science knowledge**

Page 9: Section 3: Research Priorities

Q22

Priorities design: What principles could be used to determine the scope and focus of research Priorities?(See page 27 of the Green Paper for additional information related to this question)

Economic life is directly dependent on, and a function of ecosystem health; and science production is a function of the values and principles that then direct resourcing, or investment, in research, science and innovation.
We suggest that organic principles of health, ecology, fairness and care might inform scientific decision-making at the policy, institutional and project-based level.
The safe operating space for human life is directly threatened. Climate change is but one of a suite of threats, which include novel entities, synthetic and engineered materials that drive pollution and degradation. Human activities are embedded in social, cultural and economic life. We know that when we protect our resources this achieves 3 goals: (1) protection of current and future generations, (2) protection of ecosystem value, and (3) acceleration of research, science and technology (RSI) that addresses global dilemmas.

IFOAM (2022) The four Principles of Organic Agriculture. https://www.ifoam.bio/why-organic/shaping-agriculture/four-principles-organic

Persson, L. et al. (2022) Outside the Safe Operating Space of the Planetary Boundary for Novel Entities. Env Sci. Tech. https://doi.org/10.1021/acs.est.1c04158

Steffen, W. ,et al. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347, 6223, 1259885.

Q23

Priority-setting process: What principles should guide a national research Priority-setting process, and how can the process best give effect to Te Tiriti?(See pages 28-29 of the Green Paper for additional information related to this question)

The principle of kaitiakitanga, or guardianship and protection is embodied in the Treaty of Waitangi. The principle of kaitiakitanga compliments/dovetails with our recommendation that research processes ensure that scientific missions will not increase the likelihood that our planetary boundaries are exceeded.

Quoting Boston et al. ‘The Crown also has a fiduciary duty to actively protect Māori interests and work towards equality between Māori and non-Māori. The current inequalities experienced by Māori in areas such as health status, income levels and educational attainment must be addressed, and the underlying institutional causes of such disparities necessitate a longer-term strategy.’

Science engaged in monitoring and analysis, and a research commitment to unpicking the drivers of disease and environmental pollution has been underfunded, and there has been no scope in science policy to enable complex, long-term interdisciplinary exploration that can do this research to inform policy in order to make meaningful changes across the policy enterprise to reverse the ongoing degradation and give effect to Te Tiriti.

Boston et al. (2019) Foresight, insight and oversight: Enhancing long-term governance through better parliamentary scrutiny

Q24

Operationalising Priorities: How should the strategy for each national research Priority be set and how do we operationalise them?(See pages 30-33 of the Green Paper for additional information related to this question)

Strategies should respond to persistent threats to the health and security of New Zealand, and democratic life. These persistent threats include sustained increases in: preventable non-communicable disease; waste-streams (landfill, e-waste, plastic, biosolids and wastewater); digital technologies and associated issues of (democracy related) accountability and transparency; the degradation of soil, water and air and the concordant demand that agricultural and industrial competitiveness is sustained.
1. Knowledge drives resilience. Focus on the 'tail' of science (innovation) has displaced monitoring and data which underpins and then drives knowledge systems. The Parliamentary Commissioner for the Environment (PCE) has recently drawn attention to New Zealand's failure to resource environmental monitoring and research. This pattern is repeated throughout the science system: for human health; waste streams; digital technologies; with implications for privacy, democracy and national security.
2. Transparency. National research priorities must be embedded in transparency mechanisms and withdraw from the company model adopted by universities and Crown Research Institutes . For example, funding for soil and nutrition-based research in agriculture is scarce. Millions have been directed to genetics and gene editing research in agriculture. Over a 20 year window, there has been negligible social or financial accountability to communicate how this gene editing research improved agricultural production and farm health in New Zealand.
3. Interdisciplinarity. Existing research excellence and accountability policy foci have produced barriers to inter-disciplinary science which protects health, planetary boundaries and honours Te Tiriti obligations. We observe this in the difficulty New Zealand has in meaningfully protecting freshwater ; and in preventing chronic disease (such as obesity and metabolic disease) which disproportionately affects Māori and Pasifika populations.
4. Integrated intelligence. Currently poor knowledge systems are not harnessed to provide feedback loops into policy in an integrated, transparent way that then drive checks and balances (accountability) to direct policy and science enterprise. For example, there is no feedback loop between the science production and the Environmental Protection Authority; nor is it evident that science funding for health adequately reflects the environmental and social drivers of disease.
5. Policy and regulation produce in-demand technologies. An informed science system not only provides solid evidence bases for public interest policy, but such a system also drives desirable technologies that are in global demand, for example, wastewater treatment plants that fully extract endocrine disrupting chemicals prior to release into surrounding waters; nutrition to reduce disease resistance and ensure shelf stability in export product.

Example: Agroecology and organics.
Organic and agroecological agriculture (OAA) have been identified as high-level priorities by the European Union. OAA strives to steward resources in such a way that respects surrounding ecosystems and reduces pollutant runoff. However, modern 'excellence and innovation frameworks' cannot prioritise this necessarily inter-disciplinary research as it is difficult to secure an intellectual property (IP) from current science funding processes. Current funding processes are unable to meaningfully value the ecosystem-benefit and the health benefit for farming families. In innovation systems currently, it is much easier to fund genetics research than fund long term research into the overlapping drivers of plant or animal health 'agroecology', that might include soil quality, dietary deficiencies, regional pollution, and climate change. It is much easier for scientists to write a funding proposal for single discipline forms of science. When funding environments are competitive, if a proposal is seen as too difficult to assess, as inter-disciplinary projects may be perceived to be, they are less likely to be funded.
For example, the focus on genetics makes sense in 'accountable' systems that focus on excellence, as excellent science tends to sit within a single discipline. Single discipline science is easier for funding committees to assess than long term interdisciplinary work looking across an agricultural system, such as a pastoral, horticultural or arable system.
Organic and agroecological systems tend to focus on management, requiring less synthetic (polluting) inputs. This dovetails with first, pollution reduction, and secondly, circular economy principles which now underpin agricultural European Union policy. EU policies, which have stricter environmental standards, have greater opportunities to innovate for public good, as high level public interest principles are already locked in. New Zealand's research environment is not required to invest in technologies which prevent planetary 'overshoot', including from novel technologies such as polluting chemicals.
Current funding priorities also fail to recognise the interdisciplinary farmer-science relationship. Knowledge exchange systems (extension services), used to drive farm-based take-up of the latest agricultural science, but also directly fed back into the science system, and helped scientists explore and tackle persistent challenges in agriculture.
Agriculture is open ended and complex and has a direct relationship with local ecologies and economies. It is dependent upon complexities which range from the local climate, farmer knowledge, local soil types, type of agricultural (horticulture, arable, pastoral), and the availability of local industries to both supply and process that product. The ability for a farmer to actively

pastoral), and the availability of local industries to both supply and process that product. The ability for a farmer to actively regenerate and protect the soil and surrounding ecosystems, is dependent on the knowledge of that farmer but also, of neighbours, the degree of debt, and the curiousity and desire to take these steps. Science that can inform this process has been scarce and precariously funded.
We recommend that the MBIE consider Dr Charles Merfield's submission in relation to these complexities.

FOOTNOTES:
Doing something new that improves a product, process or service. Innovations can be protected through intellectual property (IP) rights.
See Te Ara Paerangi - Future Pathways information session, comments by Chief Scientist. Juliette Gerrard. 40 mins https://www.mbie.govt.nz/have-your-say/future-pathways/
CRI purposes focus on innovation & excellence rather than public good knowledge. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/agencies-policies-and-budget-initiatives/research-organisations/cri/
Soil & Health Association (2019) Aotearoa New Zealand | Policy Proposals on healthy waterways: Are they fit for purpose? ISBN 978-0-473-50129-7 https://soilandhealth.org.nz/wp-content/uploads/2019/10/2019-NZ-NES-FW-freshwater-fit-for-purpose.pdf
Merfield, C. (2021, Nov, 13). Submission. The importance of bringing all agricultural RSI into Te Ara Paerangi -Future Pathways. BHU Future Farming Centre to MBIE.

Page 10: Section 4: Te Tiriti, mātauranga Māori, and Māori aspirations

Q25

Engagement: How should we engage with Māori and Treaty Partners?(See page 38 of the Green Paper for additional information related to this question)

See above principles.

Q26

Respondent skipped this question

Mātauranga Māori: What are your thoughts on how to enable and protect mātauranga Māori in the research system?(See pages 38-39 of the Green Paper for additional information related to this question)

Q27

Regionally based Māori knowledge hubs: What are your thoughts on regionally based Māori knowledge hubs?(See page 39 of the Green Paper for additional information related to this question)

Yes – driven by broad consultation across local iwi and local experts to establish regional priorities, and by the over-riding principles (above).

Page 11: Section 5: Funding

Q28

Core Functions: How should we decide what constitutes a core function, and how do we fund them?(See pages 44-46 of the Green Paper for additional information related to this question)

The Core Functions should be guided by the overarching principles which should be informed by broad input across scientific and lay communities in order for them to be democratically accountable and ensure that long term funding has broad approval and acceptance.

Q29

Establishing a base grant and base grant design: Do you think a base grant funding model will improve stability and resilience for research organisations?(See pages 46-49 of the Green Paper for additional information related to this question)

Yes

Q30

Establishing a base grant and base grant design: How should we go about designing and implementing such a funding model?(See pages 46-49 of the Green Paper for additional information related to this question)

A base grant funding model is essential for complex, long-term inter-disciplinary public good research.

Page 12: Section 6: Institutions

Q31

Institution design: How do we design collaborative, adaptive and agile research institutions that will serve current and future needs?(See pages 57-58 of the Green Paper for additional information related to this question)

Dr Merfield: All agricultural science providers, the CRIs, the universities, the levy payer organisations, and others need to co-ordinate and collaborate. The global planetary crises cannot be solved by the current siloed and competitive system, as noted in the Green Paper. It is also no use each of the science providers having their own extension systems. There needs to be a single unified, free at the point of use, extension system for all of NZ that is embedded across all the agricultural science providers that interacts with all farmers at the farm level

Q32

Role of institutions in workforce development: How can institutions be designed to better support capability, skill and workforce development?(See page 58 of the Green Paper for additional information related to this question)

Respondent skipped this question

Q33

Better coordinated property and capital investment: How should we make decisions on large property and capital investments under a more coordinated approach?(See pages 58-59 of the Green Paper for additional information related to this question)

Respondent skipped this question

Q34

Institution design and Te Tiriti: How do we design Tiriti-enabled institutions? (See page 59 of the Green Paper for additional information related to this question)

Ensure science is driven by the above principles. Principles of kaitiakitanga can result in novel public good discoveries – such as development of drinking water filtration systems or methods of processing biosolids.

Q35

Knowledge exchange: 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?(See pages 60-63 of the Green Paper for additional information related to this question)

It is vital that New Zealand's science system work inter-relatedly within the health system and within other government enterprises, such as regional councils, and farmer and agricultural industry organisations in order to transfer knowledge, and produce meaningful scientific research that has application on farm for decades to come.

Page 13: Section 7: Research workforce

Q36

Workforce and research Priorities: How should we include workforce considerations in the design of national research Priorities?(See pages 69-70 of the Green Paper for additional information related to this question)

Respondent skipped this question

Q37

Base grant and workforce: What impact would a base grant have on the research workforce?(See pages 70-71 of the Green Paper for additional information related to this question)

Respondent skipped this question

Q38

Better designed funding mechanisms: How do we design new funding mechanisms that strongly focus on workforce outcomes? (See page 72 of the Green Paper for additional information related to this question)

Respondent skipped this question

Page 14: Section 8: Research infrastructure

Q39

Funding research infrastructure: How do we support sustainable, efficient and enabling investment in research infrastructure?(See pages 77-78 of the Green Paper for additional information related to this question)

Respondent skipped this question