Australia's draft National Science and Research Priorities

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Office of the Vice-Chancellor
Charles Sturt University

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Dear Dr Foley

Australia's draft National Science and Research Priorities

Thank you for this opportunity to provide feedback on the draft National Science and Research Priorities. This refresh of the Priorities will ensure that Australia's efforts in science and research support a wide range of objectives, and, we hope, provide a foundation for growing national investment in research. The University supports the four proposed priorities, the associated objectives, aims, and research paths, and in particular the inclusion of First Nations knowledge and perspectives – a well-established practice at Charles Sturt.

There is, however, a gap in the draft Priorities which we feel should be addressed as a matter of urgency. The consultation document acknowledges the challenges and opportunities associated with climate change in neighbouring regions, but not in regional Australia. Regional communities across the country, and regionally-based industries, especially agriculture, are already dealing with the impacts of climate change, and will be at the forefront of any national response. Regional communities and industries need access to the latest research and research infrastructure, with outcomes informed by local knowledge, if they are to respond effectively and support national efforts.

Our awareness of this need informs much of the research at Charles Sturt University, and many or our research partnerships – whether in agriculture, environmental science, health, or other fields. It is the motivation for our lead role in the Southern NSW Drought Resilience Adoption and Innovation Hub, a consortium of nine regional partners including primary producers, Indigenous, industry and community groups, researchers, entrepreneurs, education institutions, resource management practitioners and government agencies. The Hub is an engine of user-driven innovation, research, adaptation, and adoption, and, through our partnership with the Department of Agriculture, Fisheries and Forestry, ensures regional stakeholders have a voice in the national response to changing climate conditions.

The Southern NSW Drought Resilience Adoption and Innovation Hub is an example of the University's place-based, cross- and multidisciplinary research – work that cuts across all four of the proposed National Science and Research Priorities and shows how regional universities, communities and industry are already contributing to national efforts. I would be pleased to provide you with more information on the work of the Hub, on the other Priority-aligned research underway at Charles Sturt, or any of the ideas raised in the attached submission.

Yours sincerely

Professor Mark Evans
Deputy Vice-Chancellor (Research)

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General comments

Charles Sturt University welcomes the refreshing of the National Science and Research Priorities, and we support the four proposed priorities and the associated objectives, aims, and research paths.

We particularly welcome the inclusion of First Nations knowledge and perspectives in the new National Science and Research Priorities. Indeed, Charles Sturt University has a long-standing practice of genuine engagement with First Nations communities that includes embedding First Nation's knowledge and perspectives into course content and research project design; for example in Professor Lee Baumgartner's world-leading work in freshwater ecology and other research projects at the Gulbali Institute for Agriculture, Water and the Environment.

There is, however, scope to improve the priorities. The University offers various suggestions in the responses to the consultation questions below. One overarching gap, which Charles Sturt University recommends the Chief Scientist and the Department of Industry, Science and Resources should address urgently, is the lack of any mention of the science and research issues, challenges, and opportunities in rural, regional and remote Australia.

It could be said that by virtue of their National scope the revised priorities implicitly include regional areas. As a University established and almost exclusively operating in regional communities, and in close partnership with them, our experience indicates this is not enough.

Climate change is an issue that cuts across all four of the proposed priorities and many of their aims, objectives and critical research paths. The recent Employment white paper noted that many regional communities are particularly vulnerable to climate change, in part because of their dependence in a few, emissions-intensive industries. Adaptation, mitigation, and economic transformation are therefore high priorities for these communities, and the way forward depends on access to local knowledge and expertise, on working with research partners who understand the needs and challenges of the region, and on quality research infrastructure. Local access is essential because, as noted by the Productivity Commission in its most recent inquiry into productivity, "spillovers from place-based programs are localised … declining rapidly with distance" (Productivity Commission, *5-year Productivity Inquiry: Innovation for the 98%* (Inquiry report – volume 5), February 2023).

Regional communities and businesses looking to innovate cannot, then, depend on the results of research in major metropolitan centres somehow flowing to them, or even meeting their needs. They have less capacity, by virtue of distance and other factors, to establish research partnerships with metropolitan universities, or gain access to metropolitan research hubs, precincts, and infrastructure. Nor can they depend on metropolitan-based research and innovation partners who leave the region as soon as the project is done, or the grant funding runs out. In particular, they cannot depend on national policies, programs, and priorities providing benefits in regional areas without there being an explicit requirement for those policies, programs, and priorities to do so.

Charles Sturt University suggests, then, that each of the four priorities should include a statement on the importance of building and maintaining broad research capability – people and infrastructure – in rural, regional, and remote areas to support local responses to local challenges and to contribute to the national science and research effort.

Consultation questions

1. **The draft priorities intend to identify specific challenges facing the country that will require multidisciplinary and multisector efforts to address. Do they achieve this objective? How can we improve them?**

Overall, the draft priorities achieve the desired objective, through there is room for improvement, Charles Sturt University suggests the final National Science and Research Priorities should include:

- a strong statement on the importance of basic or blue-sky research, not only as the underpinning for subsequent application but as a fundamental part of national identify and in recognition of the need for Australia to continue to contribute to the global stock of knowledge,

- some discussion of the role of the education system (and school teachers) in building an understanding and appreciation of science and research, their contribution to the national science and research effort, and in improving awareness of the National Science and Research Priorities,

- explicit acknowledgement of the importance of research capability outside major metropolitan centres,

- similarly, explicit recognition of the importance of research in the Humanities and Social Sciences (HASS), and in their own right, not merely as adjuncts to research in other fields, and

- Acknowledgement and discussion of the role of science and research in social policy – for example in creating the social and political conditions necessary to support emissions reduction and transition to net zero.

2. **Feedback stressed the need to work in partnership with First Nations people to embed First Nations knowledge and knowledge systems in the way we address national challenges. How might governments and the science and research sector best work with First Nations people to achieve this objective?**

This question is framed as if there is a gap in current practice. That may be the case in some research organisations, but at Charles Sturt University the framework for embedding First Nations knowledge and knowledge systems into teaching and research already exists, and is having an impact. An example is the [Indigenous Research Methods and Methodologies]() unit (IKC501) offered through the School of Indigenous Australian Studies. The unit includes topics on Indigenous cultural competency principles in research, Indigenous methodologies, and a research project relevant to the student's career or further study.

More generally, the University suggests that embedding First Nations knowledge and knowledge systems should follow the approach set out in the [*AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research*](). This approach was recommended and supported at a recent Universities Australia (UA) workshop on Ethical Conduct and Engagement in Indigenous Research and is part of the UA Indigenous Strategy.

Above all, the final National Science and Research Priorities should include an acknowledgement that First Nations ways of knowing, being and doing are different and may not align with Western science and research approaches, and emphasise the importance of genuine co-development and listening – a "nothing for us without us" approach to First Nations knowledge and knowledge systems.

3. **The draft priorities provide a range of critical research paths. How could we refine these research paths, for example, to address immediate challenges?**

The 'critical research paths' concept in the draft Priorities is not clear. While there are critical areas of research listed for each Priority, each needs to include a better explanation of how it will help achieve the Priority's aims as this may not be obvious to a wider audience, or even other researchers who are not specialist in the relevant fields. A better explanation of the pathway from research activity to aims to objectives will help improve understanding of the Priorities, why they are needed, and what they are intended to achieve.

There is also scope to include information about:

- the enabling capabilities for critical research areas (e.g., data science for many of them) – as this will help identify areas of overlap between the four priorities and show where HASS disciplines have a role,

- the enabling technologies for each Priority, Aim and Objective, and

- the enabling infrastructure – especially NCRIS facilities.

Including this information will help identify capability, technology and infrastructure gaps, and therefore potential priorities for investment.

4. **How would you implement the priorities in your organisation or setting? What mechanisms would support implementation?**

In many ways research at Charles Sturt University is already well-aligned to the National Science and Research Priorities, with projects under way on regional health and mental health, biodiversity and biosecurity, resilience and value-add in agriculture, and building stronger communities.

We also have established research Institutes that encompass many of the Priorities:
- the Gulbali Institute carries out agriculture, water and environment research, grounded in Charles Sturt's footprint across the Murray-Darling Basin, with impact across Australia and globally

- the AI and Cyber Futures Institute is focused on building secure, sustainable, responsible, and inclusive technology to maximise human potential and wellbeing

- the Rural Health Research Institute conducts research that addresses the rural health gap in communities across regional and remote Australia and internationally.

Each of these Institutes was established to carry out multi- and cross-disciplinary research, with a challenge or mission-based approach to many projects.

In addition, Charles Sturt University has faculty-based centres for research and teaching in Education, Law and Justice, Policing and Security, Customs and Excise Studies, Islamic Studies and Civilisation, and other fields, and major projects (under the University's Sturt Scheme) on contemporary threats to Australia, organisational resilience, interdisciplinary education research, the future of the professions, and ageing well in rural and regional Australia.
The University is strengthening its capability in the Institutes and Centres through targeted investment, the recruitment of leading researchers, and growing the number of higher degree by research students.

Research at the University is supported by a wide range of world-class research equipment and facilities, such laboratories rated for research with genetically-modified organisms, quarantine facilities, simulation centres, and an 1800 ha commercial farm, enabled as a digital farm to progress the digital literacy of our students and the community, as well as facilitate industry-based RD&C.

The University is therefore well-positioned to set up research centres, groups, and projects on any of the revised Priorities, and to undertake work in many of the identified critical areas.

5. **The National Science Statement will explain the role our science systems will play in delivering the priorities and maximising the benefits from science for Australia. How can the following best support the priorities:**

   a. **Science agencies**

      Australian and state government science agencies (and departments) can help community and industry understanding of the revised Priorities and their objectives by showing how their work supports the National Priorities.

      From a regional perspective it would be beneficial for these agencies to have a better awareness of challenges, opportunities, and capabilities in regional areas, in part by growing their presence outside metropolitan centres. For some of the stated Aims and Objectives – such as protecting biodiversity, ensuring equitable access to health care, or improving food safety and security – it would not be unreasonable to expect science agencies to partner with regional organisations (universities, industry, and others) on relevant projects.

   b. **Science infrastructure**

      As noted above, the final National Science and Research Priorities could include information on enabling infrastructure across the various aims, objectives, and critical areas. The goal in doing so is to provide better information to researchers and their partners on what infrastructure is available, increase use, and avoid duplication – but also to identify gaps that may need to be addressed by further investment.

      On this issue Charles Sturt University suggests that it would be useful to undertake a follow-up use census and review of the National Collaborative Research Infrastructure Strategy and other research infrastructure programs to ensure that they are aligned with the revised Priorities, determine the level of future investment needed to build and/or maintain critical national facilities, and build the policy and business case for national investment in research infrastructure.

   c. **Australian government science programs**

      While Charles Sturt University understands the intent of the Priorities is not to channel all Australian Government science funding into a limited range of fields, this refresh does provide an opportunity to examine the current suite of programs and assess whether they provide a suitable way to achieve national goals in science and research. In many ways they are not. In our submissions to date on the Australian Universities Accord Charles Sturt has made the following observations and proposals:

      - There are too many Australian Government science and research programs, spread across too many departments and agencies. As a result, research organisations (and businesses) expend considerable time and effort on funding applications, for uncertain results.
      - Many of these programs are too narrow in focus and were often set up in response to political pressure or opportunity, rather than to achieve national goals.

      - The plethora of programs contributes to the chronic problem of grants that do not meet the full cost of the research they are supposed to research.

- These problems can be addressed by rationalising the current suite of programs. Fewer, more flexible programs offering larger grants would better suit the breadth and cross-disciplinary nature of the revised National Science and Research Priorities.

- A new program architecture would also support approaches to project assessment and selection. For example, funding some projects on the basis of potential rather than the current over-reliance on track record would help build national capability in emerging fields. It could also address the perennial problem of improving SME access to industry-oriented research and innovation programs, especially in the regions.

The University also suggests that the final version of the National Science and Research Priorities consider the implications of any recommendations arising from the Australian Universities Accord and those from the recently-completed review of the ARC Act. Ideally, they and the National Science and Research Priorities will be mutually reinforcing.

d. Domestic and international science relationships

Charles Sturt University has a range of international teaching and research partnerships across the Asia-Pacific region. These partnerships not only support Australia's regional diplomatic and scientific relations; they result in findings that can be directly applied in Australia, whether in freshwater ecology and aquaculture, biosecurity, or tropical diseases.

There are some challenges to maintaining and building these partnerships, though. They include access to funding (sometimes at both ends), visa processing delays, and a misalignment between migration, science and research, and diplomacy policies and priorities. Charles Sturt University hopes that the Australian Government's response to the migration review (and the Employment white paper) will address some of these challenges, A key goal for any reforms – whether in migration, higher education, employment, or science and research – should be to ensure multi-layered benefit: opportunities for Australian researchers and students, exchange programs that boost bilateral and multilateral links, and a clear alignment with foreign policy objectives in the Asia-Pacific region, all supporting science and research that meets the needs of all Australians – including those in rural, regional, and remote areas.