

Northern Territory Research and Innovation Board Submission to
House of Representatives Inquiry into International Research
Collaboration

1. Northern Territory Context

The Northern Territory is home to about 250 000 people of whom 30% are indigenous and more than half of the total population is concentrated in Darwin. There is a strong gradation from the tropical north to the desert south, and a major divide between urban centres and dispersed and sparse remote communities. Due to the limited population base, the number of formal research institutions is small, and researchers are concentrated in the tropical north, at Charles Darwin University (CDU), Menzies School of Health, Northern Territory government agencies and CSIRO Sustainable Ecosystems. There is a small research presence in the south, at CDU, government agencies, the Centre for Remote Health and CSIRO, supported by wider research partnerships generated by the headquartering of the Desert Knowledge Co-operative Research Centre in Alice Springs. Research activity in the south is augmented by a number of ‘second tier’ organisations such as the Centre for Appropriate Technology (CAT) which work more directly with their constituents, often with a focus on specific issues.

There is a clear contrast between the opportunities for research dealing with the modern global economy, such as those arising from major oil and gas industries on the northern coast, and those which relate to the livelihood needs of remote communities. It would be unrealistic to suggest that the Northern Territory has a major role to play in the development of cutting edge technologies for the global economy, but it has a critical role in addressing issues specific to its tropical and desert environments, such as health, livelihoods and sustainable land management particularly in, but not exclusive to, remote environments. Consequently the Northern Territory deals with research challenges which can differ markedly from those of other states and territories, but which are common to other jurisdictions internationally.

The Northern Territory is uniquely placed logistically with world-class research facilities to engage in research collaboration and training with Asia, particularly Indonesia.

The Northern Territory Research and Innovation Board is the body charged with providing advice to the Northern Territory Government on research and innovation matters. The Board also interfaces with the national research and innovation network on behalf of the Northern Territory. The Board regularly funds a round of scholarship and research and innovation grant opportunities for Territorians. The Board also

operates an awards program to bring to public attention the many benefits to the community that arise from research and innovation in the Northern Territory.

2. Inquiry Terms of Reference

The Northern Territory Research and Innovation Board is aware that separate submissions to the Inquiry will be made by the Northern Territory Government, Charles Darwin University and the Menzies School of Health Research in the Northern Territory and CSIRO at a national level. The Board strongly supports these institutional submissions; for completeness this submission will focus on international research collaborations likely to fall outside the briefs of these organisations.

2.1 The nature and extent of existing international research collaborations

2.1.1 The limited scale of research organisations dealing with remote desert and tropical issues has resulted in unique collaborative arrangements both amongst the organisations within the Northern Territory and between these and their international counterparts. These serve the purpose of achieving critical mass and enabling technologies and solutions to be tested in diverse situations to determine their robustness.

Examples include the constellation of organisations clustered around the Desert Knowledge Precinct in central Australia:

- Desert Knowledge Co-operative Research Centre collaboration with the Karoo Development Foundation in South Africa in support of small and medium business enterprises in disadvantaged communities, and initiation of similar collaborations in British Columbia.
- Desert Knowledge Australia's developing collaboration with the Desert Research Institute in Nevada
- Centre for Appropriate Technology's projects in India and with the National Renewable Energy Laboratory (NREL) in the United States.
- CSIRO's recent collaboration with the Indian Central Arid Zone Research Institute, to improve detection and management of desertification in Rajasthan.

In the north, CSIRO has a strong relationship with savanna researchers and managers in South Africa, which has led to the establishment of biodiversity monitoring in Kruger National Park. They connect with fire researchers around the world.

The Northern Territory also has a number of key researchers working in the private sector who are actively engaged with and in some instances leading international fora.

2.1.2 Experience gained from these projects indicates there is a staged route to successful international collaboration which may progress over a number of years:

- initial contact with international peers by individual researchers, through opportunities such as international conferences, or international visitors
- progression to conception of a research approach and framing of a research proposal and gaining of local and international institutional support, and finally
- obtaining funding, conducting the research and transfer of knowledge between the collaborative partners.

The unique aspects of some Northern Territory research occasionally provide for an alternate route to international collaboration. In the case of the Centre for Appropriate Technology (CAT) a project developed nationally within Australia was recognised by the Commonwealth and promoted internationally as an Australian initiative in rural village energy supply. CAT was introduced to their Indian counterparts through the success of the project in Australia. This engagement would not have occurred without the intervention and funding of government to facilitate the collaboration.

Regardless of the means by which collaboration is established, seed funding from government is a critical element.

2.1.3 The nature of the environment in small jurisdictions often means that:

- in the case of remote jurisdictions, the distance from institutional networks invariably places constraints on continuity of engagement with such international groups or roles
- turnover of staff results in leakage of intellectual capital and hampers progress in gestation of international collaborative initiatives.
- key individuals may be required to represent their constituencies on international reference groups more frequently than they would in a more populous jurisdiction, and these roles are critical for two-way learning and appreciation of one another's contexts. We note however that financial support is often more difficult to attract in smaller jurisdictions. For example there are only two members of the Academy of Technological Science and Engineering in the Northern Territory.

2.2 The benefits to Australia from engaging in international research collaborations

2.2.1 Benefits from international collaborative research are universal across all Australian jurisdictions, and will not be addressed further here.

2.2.2 There are additional benefits to the Northern Territory's research environment. Retention of experienced research staff is a particular challenge, and the opportunity to participate in international research is important to building and maintaining commitment to the research and to the home institution, and to retention of key staff.

- 2.2.3 Hosting international researchers is also vital, not only to stimulate new ideas, but to ensure that the Northern Territory context is well understood by international peers engaged in research collaborations and in review of local research or scientific publications.

We note that special support for research collaborations appears to be in place for countries such as India, China and Brazil; however these countries are not always relevant to Northern Territory research capacity and interests.

2.3 The key drivers of international research collaboration at the government, institutional and researcher levels

- 2.3.1 There is an enormous capacity-deficit in the Northern Territory if it is to successfully meet development goals. Lack of major institutions in the desert and remote Northern Territory has stimulated the numerically smaller research organisations to engage internationally to address knowledge gaps which are common to other regions.
- 2.3.2 Experience has shown the importance of relationships at a personal and individual level in fostering international collaborations in research.
- 2.3.3 Government has a particularly important role to play in fostering research in the absence of large research institutions, especially through funding.
- 2.3.4 Robust solutions to problems encountered internationally can be tested in remote environments in Australia. Likewise, it is beneficial to test Northern Territory research-derived technologies in different international environments, as has been done for example with CSIRO's remote sensing technologies in collaboration with Indian and Japanese colleagues, and with CAT's Bushlight program in India.
- 2.3.5 The Northern Territory has experienced a high level of demand internationally for translating or positioning technologies – i.e. explaining it in a cultural context and facilitating implementation at a local level. CAT's engagement with NREL in the United States was due to expertise in translating energy technology into village environments which was seen to complement the NREL technological strength. This can be an organic flow-on from international research collaboration and an initial driver in enhancing the relationship and establishment of the collaboration.

2.4 The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these

- 2.4.1 Ready exchange of people in non-government organisations who work with institutions in developing countries is a major impediment. In these situations

there is less structured funding and resource support from institutions on either side. This disadvantages the Northern Territory in particular. In some instances accessing visas and documentation is more difficult when dealing with remote regions in developing countries.

- 2.4.2 In developed countries, governments usually do not fund research for non-citizens of the funding country, or they may fund operational costs but not salaries of researchers. Achieving funding simultaneously for collaborative research in both countries is difficult.
 - 2.4.3 Researchers working in remote regions have often been fly-in/fly-out – they add to the research effort but not to the critical mass of resident knowledge, and the benefit to remote communities can be slight or non-existent. It is difficult to build up relationships with Aboriginal people and other stakeholders without sustained, long-term engagements.
 - 2.4.4 Lack of access to seed funding for international collaborative projects is a major impediment. Seed funding is required to infuse an increase in international research collaboration into Northern Australia and should specifically target the unique characteristics of Northern Australia.
 - 2.4.5 Language can also be an impediment in many of the Asian countries targeted by Northern Territory researchers and indeed within the indigenous communities where research takes place. Increasingly researchers are relying on indigenous research partners and interpreters. As this practice expands there will be a case for the inclusion of indigenous research assistants in international collaborations. This would include payment for services and access to international programs to widen experience.
- 2.5 Principles and strategies for supporting international research engagement
- 2.5.1 The Northern Territory has a mechanism in place in the strategy-setting of the Northern Territory Research and Innovation Board and the Northern Territory Research and Innovation Fund. The availability of a dedicated fund will enable the Board to support international collaborative research on a sustained basis for the Northern Territory.
 - 2.5.2 There is in place a collaborative agreement across Northern Australia which is ideally placed to support international collaborative research. The Cooperative Framework on Tropical Science Knowledge and Innovation brings together Northern Territory, Queensland and Western Australian researchers to collaborate on key sectors of importance to Northern Australia. This capability can be utilised to facilitate a plethora of international collaborative projects. It should explicitly support activity for the entirety of Northern Australia, including desert and remote regions, and not be confined to the tropics.

2.5.3 A number of Northern Territory-based companies develop research collaborations through the provision of commercially-based research work where the unique solutions required for difficult place-based work require them to develop research programs and find solutions within their commercial arrangements. This activity is encouraged within the Northern Territory as it provides the base for a fee for service research culture and is more closely linked to commercialisation of knowledge.

3. Recommendation

3.1 The Northern Territory Research and Innovation Board recommends:

That a special category of seed funding be established at a national level specifically for international collaborative research projects to target the unique characteristics of Northern Australia. The funding should be accompanied by minimal administrative infrastructure commensurate with appropriate governance requirements.

Northern Territory Research and Innovation Board

10th February 2010