



SUBMISSION TO THE DISCUSSION PAPER:

***Western Australia's Science, Technology and Innovation
Advisory Bodies
An Independent Review***

By

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Background

The Desert Knowledge Cooperative Research Centre (DKCRC) is a partnership of 28 agencies, government departments, non-government organisations, desert communities and universities whose research focuses on the people and communities of the remote arid regions – the three per cent of Australians who live on 70 per cent of the land mass. We cover four States and the Northern Territory from the edge of the Great Dividing Range to the Indian Ocean. This means we operate across jurisdictions, within the boundaries of the desert and not within state or territory borders, to provide a truly national perspective on desert living.

DKCRC also works across disciplines and sectors, bringing together biophysical and social scientists, Aboriginal people, industry representatives including resource developers, tourism operators, pastoralists and policy and service delivery agencies from all levels of government.

Our research program is integrated, rather than strictly discipline-based. Our objectives are to:

- Provide sustainable livelihoods for desert people that are based on natural resource and service enterprise opportunities that are environmentally and socially appropriate
- Encourage sustainable remote desert settlements that support the presence of desert people, particularly remote Aboriginal communities, as a result of improved and efficient governance and access to services
- Foster thriving desert regional economies that are based on desert competitive advantages, bringing together Aboriginal and non-Aboriginal communities, government and industry
- Apply social science insights into governance, human capacity and the design of appropriate institutions to all of these outcomes.

The program involves scientific and technical research, which ranges from environmental research to appropriate housing and infrastructure design and often means applying existing technology to new ends or making systems work better for desert people. At the same time, we apply social science insights to what makes communities work and to how we can develop appropriate and sustainable local-level economic activity to support these communities.

Taking research into the desert community is not simply a matter of what our research partners bring: it is also about what they learn from the experience. The Desert Knowledge CRC has evolved because of its ability to develop meaningful collaborations. Clearly this is a feature of successful CRCs, where the collaboration between Centre Partners and Associates is critical to operating effectively. But the success of DKCRC in overcoming the tyranny of distance has taught us the true importance of collaboration for effective desert engagement. In our region, we take the time and make the effort to build relationships because we have come to understand that successful collaboration depends on those relationships.

We have developed collaborations involving business and industry, between the designers and suppliers of technology and end-users, as a platform for research into better ways of doing things in, for example, improving cattle management in the pastoral industry or investigating factors making for success for Aboriginal business.

Aboriginal people are significant contributors to our research program and we work extensively with people in remote Aboriginal communities on collaborative projects researching sustainable housing, water use, infrastructure and business development as well as natural

resource management. Their knowledge is integral to our research and valuing Aboriginal intellectual property is embedded in our practice and philosophy. DKCRC has a Protocol for Aboriginal Knowledge and Intellectual Property and an accompanying Good Manners Guide for working with Aboriginal people. This relationship is reciprocal: we share knowledge and we learn from each other's ways of doing things.

Our Desert Knowledge – and the way we do it - is exportable, not just to other countries with large desert areas, but also to countries with small and dispersed remote area populations. The recent Desert Knowledge Symposium 2008 was attended by delegates from India and South Africa and we have presented our research at conferences in Mongolia, China and the United States and Canada.

We are refining our approach in our bid for renewed funding and a new identity as the Desert Cooperative Research Centre.

The Discussion Paper

It is perhaps more appropriate that we offer a contextual comment on the *Strategic directions for WA science, technology and innovation* section, rather than answer specific questions that require a more intimate knowledge of the WA research scene. The specific questions we are guided by are:

- *What are the science, technology and innovation challenges facing WA now and over the next two decades? and*
- *What are the main gaps and opportunities that you want this review of science, technology and innovation advisory bodies to address?*

It is instructive to refer to the 2009 Draft Interim Report of the Organisation for Economic Cooperation and Development Innovation Strategy, which sets the challenges for research and innovation admirably.

'What has propelled it [research and innovation] far up the policy agenda is a confluence of factors that have emerged over the past decade:

- *The growing urgency of several challenges of a global nature such as climate change, health, food security and poverty that require stronger innovation and new forms of international collaboration and governance if they are to be addressed.*
- *The search for economic growth as the world descends into one of the sharpest slowdowns in several decades and policy makers look to innovative and entrepreneurial activities to form a basis for long-term, sustainable growth.*
- *The continued globalisation of economic activity, heightened by the emergence of new players, that has opened new markets and opportunities, and is pressuring countries to innovate and move up the value chain.*
- *The rapid advancement and diffusion of general purpose technologies such as information and communication technologies, especially the Internet, which is altering the methods as well as lowering the barriers to collaboration, networking and engagement of a wider cross-section of innovative actors and driving the informatics revolution which is changing the way we innovate.*
- *The emergence of a much broader view of innovation and its role in strengthening economic performance and quality of life, notably the key role of non-technological*

innovation and the growing participating of users, consumers and other non-traditional players in innovation.

- *The increasing interdisciplinarity of research and development at the technological frontier that has altered the mix of skills needed, increased the cost as well as the risks of engaging in innovative activities, and calls for innovative forms of international governance and effective use of policy instruments to ensure benefits continue to be captured.*

'These factors have fundamentally changed innovation – its content, how it is conducted, who participates, where it is performed and why it is increasingly integral to economic performance and social welfare. Policies that seek to promote innovation have not necessarily kept abreast of these changes, sometimes reducing their efficacy. Moreover, innovation policy today is still often seen as elitist and not sufficiently connected to policy goals that are at the centre of the public debate. So as the very nature of innovation changes, the challenge is to adjust the way innovation policies are designed and implemented.'

This extract aptly outlines the challenges and opportunities for research and innovation throughout Australia. It has, however, particular resonance for Western Australia in that firstly it is an *inclusive* commentary: it argues against concepts of 'difference' and describes social, economic and other factors common to all jurisdictions and innovation contexts.

It is clear from the Discussion Paper that WA regards itself as different from the rest of Australia. Certainly there is geographical isolation, but this should not necessarily lead to insularity, which may not be particularly helpful in either defining or meeting challenges and opportunities. WA might not in fact be all that different from other jurisdictions in Australia - and probably elsewhere - that are emerging into the research field after the more populous states have already established solid research profiles and have developed strategic plans to build on those profiles, particularly in the areas of biotechnology and IT.

From an outside perspective, WA's higher education and research institutions are already well-represented as partners in the national Cooperative Research Centres and there are numerous Centres of Excellence. Researchers from these institutions have an excellent reputation and are already making a major contribution to the success of CRCs as diverse as our own Desert Knowledge CRC and the CRC for Spatial Information.

Translating this representation into a broader national contribution is a challenge. It would appear that few of the CRCs represented in WA are home-grown: that is, initiated in WA and creating national leadership in field of endeavour. Consistent with the State's research and development funding profile, with 63 per cent of all R&D funds devoted to mining (three times the national average) the WA-grown CRCs are almost exclusively devoted to mining and resource development. We note that business accounts for about 70 per cent of R&D funds and perhaps contributes an even greater share towards innovation. This indicates a positive climate for innovation.

WA needs, however, to think beyond the resource development and business sectors. Clearly they are important to WA's current and future directions. It is likely, however, that WA faces the same tensions as other States and Territories between apparently competing needs from diverse sectors: development, agriculture, land-based aquaculture, fisheries, recreation, tourism, cultural heritage protection, transport and communications. Resolving these tensions is a critical function of government that requires an evidence base – from sound research – in

order to be truly effective. Developing this function presents another challenge for the advisory bodies.

While WA spends an amount close to the national average on agriculture, forestry and fisheries research, these key areas need a stronger research focus. WA's primary production profile includes broad-scale agriculture, fruit production, savanna-based pastoralism, forestry and three discrete fishery zones in the south, to the west and across the northern coastline. Maintaining the integrity and productivity of these sectors through the challenges of prolonged drought, climate change and uncertain economic times is a major research challenge.

It should be noted that funding for WA research into services – which would include human services and community development – is about one-third the national average. This leaves open the question of the place of human and social dimensions in WA's research profile. Innovation is not simply about science and technology. The State has, for instance, a large Aboriginal population relative to the total WA population and meeting the needs of these diverse and geographically scattered peoples – community development, health, education, housing and infrastructure, developing local and regional economies, promoting and supporting Aboriginal cultures and arts - is as critical to WA's future as maintaining its resource base. Positioning the research effort to meet these social needs presents another critical challenge for the advisory bodies.

Clearly there is a strong potential for collaboration and the CRC model, which invites cross-jurisdiction and cross-disciplinary research involving the social dimensions of science, technology and innovation, has much to offer WA. The advisory bodies may well consider how to initiate or inspire more CRC development activity as a means of making the research dollar go further. As the Discussion Paper notes (p15), CRCs are highly effective in leveraging research spending.

Perhaps the major challenge, however, is to conceptualise the entire research effort as a coherent plan. This may well need a wider discussion than one which is about the role of advisory bodies and this could involve thinking about:

- Developing a focus for the research effort
- Creating partnerships across jurisdictions and disciplines
- Decentralising the research and innovation effort
- Setting targets
- Building a solid educational foundation within and outside the research arena.

Developing a focus

Western Australia is well-placed to deliver research that results in:

- Commercialisable products – for pastoralism, mining, recreation and tourism, regional and remote communications
- Commercialisable services – for all of the above
- Value for business – improved ways of setting up vibrant and viable regional and remote area businesses, in commercialising Aboriginal knowledge, in underpinning a bush products industry
- Value for communities – in identifying factors for sustainability and developing livelihoods
- Value for policy – infrastructure development, social policy, environmental protection.

Creating partnerships

Effective and efficient research linking WA with the rest of Australia could include:

- Cross-jurisdictional scope for research projects to enable economies of scale, leverage funding and maximise the impact of the research effort
- Involvement of policy designers in research to maximise uptake of research findings at all levels of government
- Cross-disciplinary approaches to maximise return to as many of the five focal points above as possible
- Cross-cultural and participatory research to acknowledge, respect and apply both Aboriginal knowledge and remote living know-how to contemporary research questions and to build research teams that represent more accurately the make-up of the WA's peoples; and which engender a greater sense of ownership of processes and outcomes

Decentralising the research effort

It is neither logical nor reasonable to focus the research effort on Perth alone. Regional cities and towns are well-placed to make specialised contributions to the overall research effort in areas such as mining, pastoral development, agriculture, viticulture, communications and transport, fisheries, environmental management, maritime security, including biosecurity, climate-specific challenges to communities – particularly fire abatement and carbon footprint management - and tourism.

Setting targets

All State strategic plans set targets for an improved research effort. WA could think about the kind of targets for scientific, technical and social research and innovation that would be relevant to its future directions.

Building a solid educational foundation

The educational component of the research effort should not simply be devoted to adding to the gene pool of postgraduates. If WA's research needs are as diverse as the State's economic, scientific and social profiles would suggest, and then some thought could be given to overhauling school education as a foundational measure and promoting Vocational Education and Training pathways into research. This is particularly relevant for those large and sparsely-settled areas of the State where there is a marginalized Aboriginal population with little scope for personal or community development.