ANZSEE Conference, Thriving Through Transformation – Local to Global Sustainability, University of New England, Armidale, October 19-23, 2015

Functional remoteness in sparsely populated areas of Australia

Dr Judith Lovell

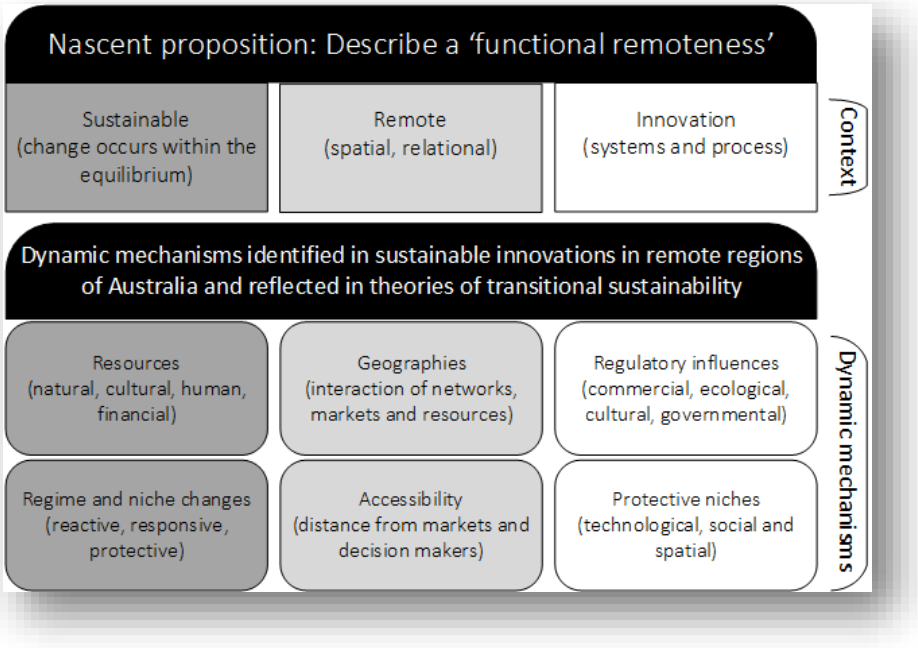
Senior Research Fellow, Northern Institute

Research Leader, Cooperative Research Centre for Remote Economic Participation, Synthesis and Integration Project

Charles Darwin University, Alice Springs, NT, Australia

judith.lovell@cdu.edu.au

Graphical Abstract



Highlights

- Transitional sustainability theories provide a framework for spatial and relational geographic remoteness across sectors in remote Australia
- Functional remoteness underpins socio-technological and socio-cultural innovations
- Urban and remote perspectives of remoteness currently create a disjunction
- Remoteness informs research and policy, development and innovation
- Proposition to consider a framework for 'functional remoteness'

Abstract

Throughout a seven-year research cycle (2003-2010) the Cooperative Research Centre for Remote Economic Participation (CRC-REP) has focused its programs towards positively impacting in remote Australia in the three domains of *Investing in People, Enterprise Development and Regional Economies*. A synthesis of the research programmes of the CRC-REP instigated in 2014 investigates themes pertinent to remote residents and settlements, and the stakeholders and partners invested in this national collaborative research endeavour. The most overarching of themes is that of 'remoteness' because it informs research and policy, development and innovation and yet there are disjunctions in the ways remote and urban thinkers conceptualise place-based remoteness as functional or dysfunctional. This article sets out to describe functional remoteness as it informs innovations which are 'creating successful business models for remote locations to ensure long-term growth, employment and improved livelihoods' (Ninti One Limited, 2014). In each scenario functional innovation relies on local people, whose knowledge and culture are assets, and whose connection to the cultural and natural resources of remote Australia is reliant upon complex property rights and rights of access. In Australia, innovation has not yet been considered through a framework that encompasses geographic remoteness as a relational and spatial driver that empowers community and industry to create and meet market opportunities. This article presents a nascent synthesis of 'functional remoteness'; remote economic participation achieved through functional place-based and complex local systems, and the dynamics between them and the multi-agent regimes with which they interact, locally and globally.

Key words: Functional remoteness, transitional sustainability, complex systems, Australia

Introduction

Although there is not a simple definition of transitional sustainability (TS) the theory has developed globally, and literature on the subject has differentiated policy and governance, from social, or technical and financial management systems that might be required for innovation to develop to the point of market uptake and return of benefits. Transitional sustainability literature gives us two

approaches to engaging with discourse: ‘focusing on the role of narratives and framing processes respectively’ (Martin, 2016, p.150). TS literature often models successful innovation as that which has achieved transition to a new market, or completely altered an existing one, such as the early adoption of renewable energy, and the ensuing domestic uptake (Markard, Raven, & Truffer, 2012). Transitional sustainability theories are particularly useful in regard to socio-technological uptake where place-based development has fostered a resilient social licence, exerting pressure on regime dynamics to adapt or renew regulatory, policy or business frameworks that benefit wider uptake (Smith & Raven, 2012). Hansen and Coenen (2015) accept the importance of place-specificity but suggest that alternative theories are still needed to frame the dynamics between that and the geography of inter-organisational relations that sway regime dynamics. Concentration on theories of place-specificity have focused on niche development rather than on regime dynamics (p.92) and so they proposes a framework for a geography which is understood as spatial and relational, and which recognises that regime influence travels in both directions, between place-specific and multi-organisational regimes (p. 100). Complexities discussed by Hansen and Coenen (2015) of particular relevance to this synthesis of functional remoteness include the impact of spill-over from a place-specific niche through its more proximal networks, which may lessen the drivers required for the next transitional phase along the trajectory of innovation from local to less proximal inter-organisational geography.

The question this synthesis paper asks is whether at this conceptual level transitional sustainability theories provide a useful and alternate framing for the dynamics between development of place-based innovation and the sway of regime dynamics when remoteness is considered geographically as spatial and relational (Smith & Raven, 2012), rather than as a measure of accessibility by road from a larger service provision hub (Australian Bureau of Statistics, 2012). The aim is to describe the dynamics between several place-based and complex systems in which people, assets, and resources provide functional remoteness in various sectorial niches, and transition is more or less driven by the dynamics of inter-organisational and inter-cultural regimes.

Content

Section One is organised as a narrative synthesis of the nexus of policy, community, industry and academic research that pertains to aspects of remote economic participation in Australia. Section 1.1 focuses the discussion on remote economic participation and section 1.2 provides a short demographic overview of remote Australia.

Section Two provides two vignettes that highlighted characteristics of functional remoteness. 2.1. summarises the Precision Pastoral Management Systems (PPMS) which is in transition from innovative research and development project to full commercialisation in 2017 (S Leigo & Driver, 2014). Precision Pastoral Management Tools (PPMT) 'bundle' *socio-technological* tools to provide innovative management technologies useful o large scale pastoral properties in the cattle industry. The project is on track to see a more substantial uptake and adoption of PPMT than has previously occurred in that industry, and the use of a commercialisation framework is emerging as pivotal to the successful transition from innovative design to commercial product.

Section 2.2. summarises challenges the Aboriginal art sector faces as it remains a vehicle of cultural transformation, generating a multi-million dollar industry value chain (Acker & Woodhead, 2015). The industry utilises entrepreneurship and artistry to drive multiple innovative small-businesses across remote Australia. The Aboriginal and Torres Strait Islander Arts Economies research has cast a lens on the robust nature of *socio-cultural* innovation as it has occurred in the transformation of cultural and knowledge assets as a source of continued innovation and market response, but highlights the challenge of regime dynamics in which both governmentality and industry inform local remote production.

Section Three provides some comparison of the scenarios above, and proposes links based on the literature (Hansen & Coenen, 2015; Markard et al., 2012; Smith & Raven, 2012) and the proposition the paper makes for considering *functional remoteness*

Section Four concludes with recommendations for further synthesis of research in the international domain and with the policy, community, industry and academic nexus informing innovation in remote place-based and complex systems.

Section One: Nexus

This section provides a narrative for scenarios of current synthesis at the nexus of policy, community, industry and academic research that pertains to aspects of remote economic participation in Australia. For the remote pastoral industry place-based priorities are the restoration and maintenance of bio-diverse and productive land management, improved financial agency, and the accompanying changes in human behaviours required to achieve these (S Leigo, 2015; Marshall, Stokes, Webb, Marshall, & Lankester, 2014). Remote Aboriginal art centres on the other hand require cultural and natural resource, language acquisition, cultural and ecological knowledge maintenance, as well as the capacity to adapt and transform products to changing markets, using artistry. In some functional and complex art centre businesses in remote Australia, the regime dynamics include significant governmentality as well as multiple organisational dynamics, and the niches require place-specific socio-cultural development practices. Such activities are managed through Australian business regulation frameworks which are often managed in the remote art centre by a non-Aboriginal business coordinator. Arts centre businesses tend to act in responsive and reactive phases that are driven by external market, environmental, and industry or socio-cultural events. The labour force dynamics impacting on pastoral and Aboriginal art sector niches are driven by social, cultural and historic complexity and distinction, as well as regulatory frameworks which effect remote and urban populations differently (Biddle, Howlett, Hunter, & Paradies, 2013; Dockery & Lovell, in press; Howlett, Gray, & Hunter, 2016; Hunter, 2016)

1.1 Remote economic participation

This section focuses the discussion on characteristics at the nexus of policy, ideology and remote economic participation. In the context of remote Aboriginal and Torres Strait islander settlements socio-cultural, customary and local agencies impact on economic participation in ways that are not

readily apparent using national data sets (Zoellner & Lovell, in press). In a recent compendium from CRC-REP projects 'remoteness' is understood in intercultural research to describe a disjunction prevalent between urban and remote societies and the aspirations, thinking, and systems of functional remoteness (Osborne, 2016). More widely, public policy narrative and programme evaluation in Indigenous Affairs has reflected a degree of failure (Australian Government, 2015a) that N. Pearson (2016) claims is at least partly due to Australian Indigenous affairs constructing itself into a vacuum, unable to engage Indigenous-driven innovation and development. Morrison (2015) provides a similar opinion, particularly in relation to the failure of planning for the future of northern Australian development (Australian Government, 2015b) to engage with the strengths of First Peoples sovereignty and land rights (Morrison, 2015; Wunan Foundation, 2015). Consistent Aboriginal occupation of remote Australia is evident in the dominant use of first languages, the complex kinship systems which maintain an intergenerational record of the days of first consciousness and ensuing ancestral activities that shaped the land and its people. This is palpable to many familiars with the dynamics of remote Australian settlements, and provides an evolutionary lens into place-based and complex systems within which innovation, development and survival continue along an extensive timeline (Woinsarski, Traill, & Booth, 2014). This form of functional remoteness has fostered the transformation of ecological, cultural and kinship knowledge through contemporary artistry (Wallace & Lovell, 2009) and empowered the resilient engagement between place-based and complex systems with many levels of multi-organisational regimes. Australia does not yet include Aboriginal and Torres Strait Islander governance and Land Rights in its constitution, and is without a treaty between Indigenous and other Australians. Active welfare policies are the alternative to employment or entrepreneurial activity – and these offer distinctly different ideological positions (Morrison 2015; Pearson, 2016).

Over the past thirty years concerted effort has gone into the uptake of innovative technology, business and environmental management systems that benefit the pastoral sector through increased productivity and protective or restorative environmental biodiversity (Holmes, 2016; Marshall & Stokes, 2014). Marshall and Stokes (2014) explain that even in conjunction with government driven

research to develop and provide access to new resources, the social resilience required for uptake of innovation has remained low in the sector. The adoption of new business and environmental management practices has only occurred within a small minority of pastoralists who tend to be younger males with diversified businesses (Marshall & Stokes, 2014). Environmental and ecological economic theorists consider that complex ecological systems thinking requires the re-evaluation of natural, social, manufactured and cultural assets as combining intrinsically for sustainability dependant on environmental services and natural capital (Robinson, James, & Whitehead, 2016). The maintenance or rehabilitation of vital ecosystems is of primary importance, but this requires changes in human behaviours as well as in complex place-based systems and multi-organisational regimes. The challenge ecological economists recognise is reframing the dynamics of ecological systems as the ultimate intra-organisational regime dynamic (Costanza, 2015).

The concept of 'place' as evolutionary of spatial, linguistic, cultural and historic contexts ensures that place-based and geographic framing of remoteness account for agents of varying scope and scale (Hansen & Coenen, 2015). This presents an important challenge facing those responsible for the socio-economic wellbeing of sparsely settled regions in Australia and in other developed democracies (Carson, Ensign, Rasmussen, & Taylor, 2012). Currently the national policies and regulatory authorities governing remote economic participation in Australia lack coordinated 'distributional equity' (Whiteford, 2015b; Zoellner & Lovell, in press) which Wolf (1993) has described as an essential characteristic of market and non-market functionality[1]. In Australia, in common with other developed democracies and particularly the United Kingdom, distributional equity is increasingly rationalised through contracts between the state and the individual that are based on taxation, superannuation and 'active' welfare as new social contracts, rather than the preceding ideological positions which saw the state as responsible for providing for those in need (Hamilton, 2014; Whiteford, 2015a). There is a resultant saturation of non-market services in remote Australia (Lovell

[1] The term 'non-market' is used according to Wolf (1979) to refer to agencies who redistribute public revenue to meet a social need where markets have failed or are unable to be established. Wolf's (1993) non-markets include government, charity, philanthropy and not-for-profit sectors, which are not necessarily classified as 'public' enterprises in Australian Bureau of Statistics Census classifications. This point is discussed in previous research (Zoellner & Lovell, 2016, np).

& Zoellner, in press) of which national data provides little evidence, and industry multipliers required to ensure resilient and sustained opportunities for entrepreneurs or innovators are almost entirely obsolete (Zoellner & Lovell, in press). There are exceptions in every social science case of course, and the relationship of tourism and mining in the joint management of Kakadu National Park demonstrates the resilience of successful multipliers including cultural and natural resource management, ecological tourism production and the regular dry-season influx of visitors to the local art centres and art galleries (Haynes, 2015) in the vicinity of Jabiru in Arnhem Land, Northern Territory. Transitional sustainability is more difficult to illustrate in a non-market example of functional remoteness. However, in Hopevale, Cape York, Queensland, local council employment has been actively decreased since 2008, and replaced with a process of transition by former employees and other local residents from local government employees into trade and service sub-contractors. The transitional support from government grant dependency included astute local leadership, historically strong uptake of apprenticeship and the insistence by the community over time that training occur as place-based in Hopevale. With a reduced labour wage, higher productivity and capacity to tender for larger jobs due to an increased pool of local sub-contractors the council has earnt 'preferred provider' status in for all contracts in the region. This transitional pathway reduced the local Hope Vale Aboriginal Shire Council revenue from government funding by approximately 50 percent in 8 years, and increased the sustainability of a local workforce. Hopevale uses a place-based and complex system developed around resilient and cultural strengths, strong local cultural leadership which promotes self-employment, and improved regime dynamics between the local council and other organisational and governmental agents. One outcome is an increased cash flow through the whole settlements, which is in turn supporting local employment in multiplier industries, such as bait and tackle shop and a bakery (Shannon Gibbs, Ross Higgins and Mark Lawson, pers. conv. 13 November, 2015).

Blackwell and Robertson (2016) note where contextualised place-based modelling is not included in the regime dynamics, homogeneity has caused mining 'boom' cycles to fail to return benefit to local residents. Where a large industry, such as mining, has not been adequately offset by vital multiplier

industries, a degree of market failure has developed, as suggested in earlier work by Stoeckl, Stanley, Brown, and Stoeckl (2007). Some of the detrimental impacts of homogenised economic drivers in remote settlements include reduced access to essential services–such as affordable or public housing– and reduced capacity to attract and retain essential, local professional staff–such as school teachers, doctors, and police (Haslam McKenzie, 2011). These have had broad implications for the resilience of open towns and Stoeckl et al. (2007) recommended that the socio-economic benefit of multiplier industries to regional and remote areas of the Tropical Savanah in northern Australia must be preserved through negotiating guaranteed use of local supply chains when planning to bring external stakeholders into future northern Australian development. In a non-market comparison, the national approach to 'improve the health and wellbeing of individuals, families and communities' via public policy program intervention (Australian Government, 2015a, p.3) has continued to miss stated goals in relation to remote employment and workforce participation (Hunter & Gray, 2016). It should be noted though that mining companies have provided some employment in remote Australia where, according to ABS Labour Force Survey 239,100 workers were directly employed in 2011 (Ninti One Limited, 2014), employment numbers currently continue to diminish as the sector gears up to transition from extraction boom to energy efficiency modes that enable low-grade and residual ore to remain viable to export transportation modelling (Comtois & Slack, 2016).

1.2. Demographics

Demographically speaking it is possible to represent remote and very remote Australia using national data sets, however recent research confirms the shortcomings of such data sets present risks for planning, policy, community development and innovation in this and other developed democracies (Lovell & Zoellner, in press; Lovell, Zoellner, Guenther, Brouard, & McMurtry, 2016; Zoellner & Lovell, in press). National data based on Australian Bureau of Statistics Census 2011 Data (Australian Bureau of Statistics, 2014) and the Australian Statistical Geography Standard (ASGS) (Australian Bureau of Statistics, 2012) uses as a rule of remoteness the distance of a location from its nearest service centre and the status of a service centre to act as a 'hub' is determined by size of population. This Accessibility/Remoteness Index of Australia (ARIA) has values ranging from 0 (urban-high

accessibility) to 15 (high remoteness) and is the primary tool in use throughout industry and government (Australian Population Migration Resource Centre, 2014) to forecast costs associated with remoteness for public service delivery including health and education. Essentially, The ARIA defines urbanity and remoteness along the 0-15 index as road distance to service centre, with the assumption that population size is a proxy for service availability.

In statistical terms, the ASGS definition of remote and very remote Australia describes 86 percent of the landmass, which is home to approximately 3 percent of the nation's population. Of the national population 3 percent of Australians identify as having Aboriginal and/or Torres Strait Islander heritage at the last national collection of Census data in 2011. Of those, 25 percent were living in either very remote or remote Australia. In very remote regions Aboriginal and Torres Strait Islanders make up 48 percent of residents, and in remote regions that figure is nearer to 15 percent (Ninti One, 2014). Less than 2 percent of non-Indigenous Australians live in remote and very remote regions, while 97.8 percent of the population live on 15 percent of the landmass, with lifestyles that are now among 'the most urbanised in the world' (Woinsarski, Traill, & Booth, 2014, p.2). Property rights are an important example in the context of this discussion, and the geography of property and access rights provide scale to the ideological crisis effecting Aboriginal and Torres Strait Islander sovereignty (Morrison, 2015; N. Pearson, 2016). Interpretation of land rights (Australian Government, 1976) and native title (Australian Government, 1993) through constitutional recognition or treaty remains ambiguous in relation to Australian First People's sovereignty (Ardill, 2013) upon which future development (Morrison, 2015) and the capacity to aspire depend (Appadurai, 2013).

Contemporary systems of leasehold and overlapping jurisdictions are cited by governments and industry as one of the most serious constraints for sustainable development throughout remote Australian regions (Forrest & Commonwealth of Australia, 2014; Woinsarski et al., 2014). The most recent figures for pastoral land in the Northern Territory show that leaseholds are now 44 percent foreign owned (Carl Curtain, ABC Rural Report, 16 September 2016), and the GDP contribution of pastoralism in remote Australia has declined 'from high levels to barely registering this century'

(Marshall et al., 2014, p.609) . Woinsarski et al. (2014, p.121) suggests that lease distributions in the arid regions of remote Australia are approximated as:

- 50 percent pastoral leases
- 20 percent conservation reserves
- 20 percent Aboriginal-owned land
- 19 percent unallocated crown lands
- >4 percent intensive horticulture or forestry
- >I percent military use

The land tenure associated with remote leases does not always reflect land use, while mining and exploration leases overlay a significant proportion of other tenure types (Woinsarski et al., 2014; Wunan Foundation, 2015). Additionally, concerns have been raised in relation to the national policy for Developing Northern Australia (Australian Government, 2015b), which does not address the aspirations of Indigenous peoples, nor has engaged them in development or acknowledgment of their sovereign rights in relation to aspirations for the future (Morrison, 2015).

Section Two: Context

This section provides a summary of two industry sector scenarios, and compares their trajectories as regime-changers through innovation. The concept of functional remoteness is used to describe place-based and complex systems in order to better understand (a) the implications of remoteness as spatial *and* relational (Hansen & Coenen, 2015), and (b) innovation as subject to the geography and dynamics of niches and regimes (Hansen & Coenen, 2015; Smith & Raven, 2012).

2.1. Scenario One: Precision Pastoral Management Tools (PPMT)

Pastoralists in Northern Australia face two significant challenges to business viability in an industry whose status according to Holmes (2016) is now 'marginal' (p. 610). In 2010 Precision Pastoral Pty Ltd was created to manage the intellectual property in relation to the Remote Livestock Management System (RLMS), a system of automated livestock management and data collection designed for use with large herds, on large land holdings without labour or mains power. In 2011 development of the concept began with beef producers engaged from the outset in development and trialling (S Leigo, Phelps, Brennan, Driver, & McLean, 2015). Some of the challenges to the pastoral industry

include the ability to preserve and maintain biodiversity essential to sustain ecosystems, financial literacy and business skills essential to invigorate and sustain pastoral livelihoods, and the adoption and uptake of new business tools and technologies (S. Leigo et al., 2012; Marshall et al., 2014). The PPMT project was designed to benefit pastoralists through input of data useful to the management of pasture, cattle and business through the benefits of innovative technology customised with other available data sources providing information about individual properties and cattle.

The sustainability of natural and produced assets are understood as intimately linked and essential to financial sustainability, which underpins pastoral activity, and which is also dependant on healthy ecosystems to support production. Marshall et al. (2014) frames the issue of sustainability confronting the industry in terms of business management practices:

> The primary issue is falling real prices for the products produced, including rangeland products. In this operating environment, there is only one rational strategy to employ to address long-term financial sustainability; namely, a single-minded focus on business productivity that will include the land, the workforce and the herd/flock. All of these, if addressed responsibly, will drive down the cost of production (p.610).

PPMS design meant that drafting individual animals can occur as an automated system with increased accuracy and precision, even on large landholdings. From primary development, to testing live in local conditions, the technology attracted a significant Australian Government business innovation grant to take it to international markets. That pathway included establishing six remote RLMS research sites, on pastoral properties in Western Australia, Northern Territory and in Queensland, which present different seasonal conditions, pasture and cattle. A prototype, Precision Pastoral Management Tool (PPMT) is active at each research site, customising multiple data for each property. The testing will continue for two wet and two dry seasons, with input from the station owners, and managers and measurement of the benefits for producers 'economically, environmentally and personally' (S Leigo, 2015, np). As the technology goes live, it produces weekly data about the live weight of animals that is combined with existing technology and customised into a place-based system to determine the performance of livestock and pasture at each location (S Leigo, 2015).

The development framework is one of commercialisation (Leigo, S; pers.conv. March 1, 2016), and the final adoption and uptake across the sector has driven strategic planning throughout the project. The commercialisation framework includes private investor capital as well as public business innovation funding. Investors bring astute industry knowledge and intellectual property, access to a range of trial sites for utilisation, proving and performance testing, and working relationships with project staff with first-hand experience of the remote Australian pastoral industry. This project has met deliverable milestones for all development phases from concept to full commercialisation, while protecting the intellectual property (IP) developed within the process, and quantifying the value of contributions as the system developed. The milestones included concept, prototype, utilization, and current trailing, adoption, and commercialisation. There has been regular stop, no-go check points along the timeline with one of the most significant being maintaining evidence of the value of input for the invested industry partners. The goal of commercial adoption shaped the project management framework, and drove concerns as to how cost to the end user. Viability incorporated value and cost of technical development and the return on financial investment and intellectual property. Practical development incorporated access of technology to trial sites and provision of data on the performance and quality of the system, and the insight of industry trial users. Although full commercialisation is still a little time away, there are indicators from the trials that the final system will achieve rates of adoption and uptake considerably higher than traditional in this industry (Leigo, S; pers.conv. March 1, 2016).

2.2. Scenario Two: Aboriginal and Torres Strait Islander Arts Businesses

Since the1970s[2] the Aboriginal arts industry has generated value chains of socio-financial benefit stretching from incorporated Aboriginal art centres with individual artist-entrepreneur members to global customers and public and private collectors. 13,000 remote artists currently participate in economic and governance activities of 87 art centres (Woodhead & Acker, 2015, p.2), which in 2012

[2] The 1970s are consistently acknowledged as the time of transition where cultural iconography and story was given contemporary form as Aboriginal art. An industry market emerged and began to occupy a significant international space in major private and public art and museum collections. It was the policy era of 'self-determination' during which time the 'on-ground' structural assets and local governance frameworks somewhat aligned between remote communities and the priorities of governments, via the program implementation goals of the Aboriginal Land Rights Act (1976) and the Native Title Act (1993), and then the Aboriginal and Torres Strait Islander Commission (1990-2003).

realised 17,890 sales at a combined value of $6,847,603 (Acker & Woodhead, 2015, p.17). This contemporary industry draws on place-based and complex systems with embedded strength and resilience. There is continuing cultural transformation through the maintenance of assets such as cultural practices, ecological resources and human ecological knowledge of generations, passed through generations from the ancestors of the lands and waterways. The socio-economics underpinning the industry has been the subject of value chain analysis undertaken by the Aboriginal and Torres Strait Islander Arts Economies Project, in the CRC-REP (2010-2017).

Acker and Woodhead (2015) frame the challenges confronting the industry in the following way: 'Clarifying the challenges and opportunities facing the Aboriginal and Torres Strait Islander art sector is a purposeful step towards a sustainable place in the economy for Australia's first peoples living in remote regions' (p.19). They suggest that the role of an art centre and its staff is to balance the needs of the individual artists, the community, the marketplace and the funding agencies, which is demanding and complex as the number of employees in a remote art centre varies from a single person to a small group of highly committed individuals. Art centres are isolated from the points of sale which remains a significant challenge in maintaining a 'place' in a highly competitive market, yet the relationships between artists, the art centre, its staff and wider community are the fabric that 'holds' the businesses together and these are place-based and culturally cohesive. The diversity in scale and scope, business structure and management frameworks between places is increasing, as is the number of new art centres starting up– from 61 in 2007, to 87 in 2012 (Woodhead & Acker, 2014, p. ix). 90 percent of art centres currently receive benefit from government funding, and for 60 percent of those, it is that core funding which enables the business to run (Acker & Woodhead, 2015). Place-based transitions seem to be most likely to be driven by market externalities and regime dynamics that have recently included:

- Regulatory– changes to the incorporation act to bring Aboriginal corporations into line with Australian corporations (2006).
- Funding– Indigenous affairs policy has exerted pressure to provide non-art making work and provide work-place training in Indigenous employment program management.

- Global markets– these are unpredictable and nuanced, yet determine the trends in value of product, and demand continuing aesthetic innovation.
- Supply –artists are oversupplying their art centres and art centres are subject to a glut of unsold work which does not sell.
- Price points– these have changed in the face of GFD in 2010, with an increased number of products sold, but for lower prices than seen ten years ago.
- Socio-cultural expectation on art centres to meet community needs goes beyond operating as a business point for the sale of art, or delivering government employment programs.

Non-market economic support of Aboriginal art centres does not address the attraction and retention of local or non-local staff, only the provision of local employment into non-art making roles. Surprisingly, little research about the trends in these vital remote socio-economic enterprises was undertaken before Acker and Woodhead's (2015) value chain analysis.

Section Three: Comparison

With evidence of the current disjunction between remote and urban thinking there is a driving need for theory through which to frame and better understand functional remoteness as heterogeneous (Smith & Raven, 2012), and particularly where such theory enables the use of associated spatial and social concepts of geography (Hansen & Coenen, 2015). Theoretic developments in transitional sustainability has gathered momentum in the last decade, primarily through green technological innovation and accompanying local to global social and ideological regime and paradigm shifts. At its broadest definition, Markard, Raven, & Truffer, (2012) suggest that a socio-technological transition affects not only the design and use of a new technology or service, but also all related societal domains. While sustainability propositions are long-term and fundamentally transformative processes, their guidance and governance plays an important role (Markard et al., 2012).

Remote Australia is said to host a significantly higher proportion of small to medium enterprises (SME's) per capita that regional or urban Australia. However, in many remote settlements it is not possible to gauge 'market' activity using existing national data, and the distinction between the

classification of ‘private’ used in Australian National Census data collection (Australian Bureau of Statistics, 2014), and what Wolf (1993) considers to be non-market (government, charity, philanthropy and not-for-profit organisations) blurs. The distinction of ‘market’ and ‘non-market’ is important because although national data suggest that remote Australia hosts a significantly higher proportion of SME’s, the socio-economic activity of art centres is barely visible due to the constraints of available national data, which prevent verification of local market activity and in fact do not disclose the nature of what is considered a ‘private’ business in remote areas (Zoellner & Lovell, in press).

The ecological economics of natural and other assets already represents a substantive challenge to the neoclassical fundament of ‘human capital as a substitute for natural capital (natural resources)’ (Costanza, 2015, np). Ecological economics describes the relationship of ecological systems and economic sub-system which shifts the dynamics from a dominant *homo economicus* to one in which human ecologies are place-based and complex contributors within far more dynamic ecological systems. Homogenisation of place-based specificities–such as culture and gender–occurs in national data sets and it is a challenge to translate from that to multi-organisational or governmental regimes how detrimental interventionist transitions can be when derived from homogenised national sources of data (C. Pearson & Daff, 2014; Sengupta, Vieta, & McMurtry, 2015). The dynamic of governmentality that drives transitional interventions functions externally to place-based functional remoteness. There is little room in such a dynamic to imagine the fabric of place-based and complex remote functionality, and the two scenarios described in Section Two highlight low rates of adoption through external intervention. In the pastoral industry, despite high government investment driving transitional sustainability through new management and technology scenarios, there has been no real recent improvement in productivity and biodiversity (Holmes, 2016; Marshall & Stokes, 2014). In art centres, there is a disconnection between the non-market investment and monitoring of art centre businesses, and the innovative capital required to run and maintain an art centre. Innovation and artistry depend on the assets associated with individual artists and the natural, community and cultural assets upon which they draw, yet these are seldom provided with an asset value or attributed for wider

socio-economic resilience. Niches may experience spill over at the local level, which may dilute the dynamic that will drive transition, however far more analysis would be needed to establish what constitutes dilution at various scopes and scales. The example from increase in the arts centre movement has led to over production in some places and product glut in some parts of the market. The push back on this market dysfunction has been the governmental intervention driving art centres to transition into employment program providers in addition to managing arts production and business networks. Conceptualising the dynamic of functional remoteness beyond the dualism of 'urban' and 'remote' standpoints is vital to ensure the flow of local benefits. In Australia, the non-market compliance required of art centres for the public investment in them seems to threaten to outweigh the very market functions that determine their function.

To return to the centrality of functional remoteness, consider the examples, of capacity in formal and informal educational pathways occurring in community learning and language centres where individuals and cohorts are generating socio-economic opportunities themselves, setting in play process and trajectories necessary to reach future goals (Disbray & Bauer, 2016; Osborne, 2016). The strength-based development of entrepreneurial activity in ecological and horticultural sectors through traditional cultural and ecological knowledge and management is combining with technological and scientific developments in new ways, such as enrichment planting (Central Land Council, 2015; Mathew, Lee, & Race, 2016) and social enterprise (Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation, 2016). The continuing receptive and innovative market engagement by remote artists and art centres provides product to Aboriginal and Torres Strait Islander Arts industry value chains (Acker & Woodhead, 2015).

A search for comparable examples of sustainable innovation in rural Australia highlights key spatial, relational, social and regulatory differences exist which effect rural agricultural innovation and which are not characteristics of the pastoral innovation niche in remote Australia. The key contrast between rural and remote pastoral scenarios is the scale of operation – changing land use, climate adaptation, food security, technological uptake and transitional sustainability are mechanisms of collective action and partnership (Hay & Pearce, 2014). Agricultural ventures are more intense in rural landscapes –

the land is stocked with more animals per hectare, markets are more accessible, and there is less distance to travel to population centres. The social capital available to challenge environmental threats such as weed infestation, can be addressed at a regional level by landowners with government support and partnership (Cross & Ampt, 2016). Innovative agricultural practices include replenishment of introduced and weed infested pasture with native grasses, increasing the ecological value of such regions and improving the land management costs. The distinction in scale and scope between rural and remote Australia remains a significant influence in the way 'functional remoteness' is understood, and differentiated from sustainable rural innovation.

(R2d) discuss who holds employment in senior / leadership roles

Section Four: Conclusion

Acknowledging a significant contemporary ideological tension exists between urban conceptualisations of 'remoteness' and a lived experience of remote regions of Australia is incentive to conceptualise how place-based and regime dynamics produce the premise of functional remoteness. This article has presented a synthesis of remote economic activities that are dynamic and relational, with two detailed scenarios that considering how Hansen and Coenen's (2015) concept of multi-organisational regime dynamics might impact on innovation and transition in functional place-based niches in remote Australia. The current non-market (governmental, charitable and not-for-profit) intensity in relation to the functional management of the livelihoods of remote Australians (Australian Government, 2015a) is designed to assist in what Smith and Raven (2012) describe as the 'managerial 'outsider' ontology' (p.1026) through which those 'spaces' (rather than places) are conceptualised. Having a negotiated 'insider' ontology, as proposed by Smith and Raven (2012) 'that highlights the sense-making agency required in protective space dynamics' (p. 1026) can enable and sustain functional remoteness. However, in order to enable 'insider' ontology in remote Aboriginal community contexts the current inequity between employment and leadership opportunity available to local residents and that provided to transitory managers must change (Zoellner & Lovell, in press). The nexus of power and cultural agency in remote locations does not currently support innovation,

entrepreneurship or communities transitioning to sustainability in the face of such high levels of functional management by government over remote Aboriginal livelihoods (Lovell et al., 2016).

Future synthesis should also consider the lessons of other international developed democracies where there is also evidence of a socio-cultural disconnection between public policy makers, program implementers and those experiencing the policies on the ground (McRae-Williams, Guenther, Jacobsen, & Lovell, 2016). Suggested points for further synthesis include:

1. Ongoing public investment is crucial to functional remoteness, yet is becoming more competitive (Ensign & Borch, 2016)
2. Boom and bust cycles are not always conducive to transitional sustainability
3. Authenticity is an increasingly valuable asset (Ensign & Borch, 2016) and requires resilient and innovative use of place-based socio-cultural assets
4. Local development is vulnerable to 'corporate amnesia'
5. History is a guiding force on contemporary entrepreneurial capacity (Ensign & Borch, 2016; Sengupta et al., 2015)

Wider literature confirms that the CRC-REP synthesis theme of 'remoteness' captures the disjunction between urban and remote narratives adequately (Lovell, 2016), and there are opportunities for policy and industry to nurture pathways vital to remote innovation, just as cultural and ecological systems already do, and in doing so increase socio-economic benefits and wellbeing outcomes which stem from functional remoteness scenarios. Similarly with other developed democracies, a level of ongoing public investment in remote settlements, environments and economic activities is crucial, but increasingly competitive (Acker & Woodhead, 2015; Ensign & Borch, 2016; Marshall & Stokes, 2014). Equally crucial is the adoption and uptake of socio-technological and socio-cultural innovations with resilient and geographically dynamic networks and capacity to communicate in both directions, between multi-agented regimes and place-based complex systems.

Acknowledgements

The work reported in this publication was supported by funding from the Australian Government Cooperative Research Centres Program through the Cooperative Research Centre for Remote Economic Participation (CRC-REP). The views expressed herein do not necessarily represent the views of the CRC-REP or Ninti One Limited or its participants. The author wishes to thank the anonymous peer reviewers of this paper for their constructive feedback and helpful comments.

References

Acker, T., & Woodhead, A. (2015). *The Economy of Place A Place in the Economy: A value chain study of the Aboriginal and Torres Strait Islander art sector. Summary report*. Retrieved from Adelaide: http://www.crc-rep.com.au/resource/EconomyOfPlace_WEB.pdf

Appadurai, A. (2013). The future as cultural fact. *Essays on the Global Condition. London and New York: Verso*.

Ardill, A. (2013). Australian Sovereignty, Indigenous Standpoint Theory and Feminist Standpoint Theory: First Peoples' Sovereignties Matter. *Griffith Law Review, 22*(2), 315-343.

Australian Bureau of Statistics. (2012, 11 June 2014). 1270.0.55.005 Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, July 2011. *Statistical Geography.* Retrieved from http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness +structure

Australian Bureau of Statistics. (2014, 2014, 18 December). 3101.0 Australian Demographic Statistics. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0

Australian Government. (1976). *Aboriginal Land Rights (Northern Territory) Act 1976*. Canberra, ACT: Australasian Legal Information Institute Retrieved from http://www.austlii.edu.au /au/legis/cth/consol_act/alrta1976444/.

Australian Government. (1993). *Native Title Act*. Canberra, ACT: Australian Government Retrieved from http://www.austlii.edu.au/au/legis/cth/num_act/nta1993147/longtitle.html.

Australian Government. (2015a). *Closing the Gap, Prime Minister's Report* Canberra, ACT: Australian Government Retrieved from https://www.dpmc.gov.au/sites/default/files/publications/ Closing_the_Gap_2015_Report_0.pdf.

Australian Government. (2015b). *Our North, Our Future: White Paper on Developing Northern Australia*. Canberra, ACT: Australian Government Retrieved from https://northernaustralia .dpmc.gov.au/.

Australian Population Migration Resource Centre. (2014). Accesibility/Remoteness Index of Australia. Retrieved from http://www.adelaide.edu.au/apmrc/products_services/

Biddle, N., Howlett, M., Hunter, B., & Paradies, Y. (2013). Labour market and other discrimination facing Indigenous Australians. *Australian Journal of Labour Economics, 16*(1), 91.

Blackwell, B., & Robertson, S. (2016). Enduring value for remote communities from mining: Synthesising production, employment, populations, and reform opportunities. *Learning Communities: International Journal of Learning in Social Contexts [Special Issue: Synthesis and Integration], 19*(April 2016), np.

Carson, D., Ensign, P., Rasmussen, R., & Taylor, A. (2012). Perspectives on 'Demography at the Edge'. In D. Carson, R. Rasmussen, L. Huskey, P. Ensign, & A. Taylor (Eds.), *Demography at the Edge. Human Populations in Developed Nations* (pp. 4-20). North America,: Ashgate.

Central Land Council. (2015). *Ranger Program Development Stratey*. Retrieved from Alice Springs, NT: http://www.clc.org.au/publications/content/ranger-program-development-report

Comtois, C., & Slack, B. (2016). *Dynamic Determinants in Global Iron Ore Supply Chain*. Retrieved from Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation:

Costanza, R. (2015). *An Introduction to Ecological Economics* (2nd ed.). USA: CRC Press.

Cross, R., & Ampt, P. (2016). Exploring Agroecological Sustainability: Unearthing Innovators and Documenting a Community of Practice in Southeast Australia. *Society & Natural Resources*, 1-16.

Disbray, S., & Bauer, R. (2016). A Place to Learn and Work: Yuendumu Learning Centre. Learning Communities: International Journal of Learning in Social Contexts [Special Issue: Synthesis and Integration],, 19(April 2016), np.

Dockery, A., & Lovell, J. (in press). Far removed: An insight into the labour markets of remote communities in central Australia. The Australian Journal of Labour Economics, 1-50.

Ensign, P., & Borch, O. (2016). Entrepreneurship and innovation at the edge: Creating inducements for people and place. In A. Taylor, D. Carson, P. Ensign, L. Husky, R. Rasmussen, & G. Saxinger (Eds.), *Settlements at the Edge:Remote Human Settlements in Developed Nations* (pp. 379-404). Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing.

Forrest, A., & Commonwealth of Australia. (2014). *The Forrest Review - Creating Parity*. Retrieved from Canberra: http://indigenousjobsandtrainingreview.dpmc.gov.au/sites/default/files/files/3838%20Forrest%20Review%20Update%20-%20Full%20Report%20-%20Complete%20PDF%20PRO1.pdf

Hamilton, M. (2014). The 'new social contract' and the individualisation of risk in policy. *Journal of Risk Research, 17*(4), 453-467. doi:10.1080/13669877.2012.726250

Hansen, T., & Coenen, L. (2015). The geography of sustainability transitions: review, synthesis and reflections on an emergent research field. *Environmental Innovation and Societal Transitions, 17*(December 2015), 92-109.

Haslam McKenzie, F. (2011). Attracting and retaining skilled and professional staff in remote locations of Australia. [Y]. *The Rangeland Journal, 33*(4), 353–363.

Hay, R., & Pearce, P. (2014). Technology adoption by rural women in Queensland, Australia: Women driving technology from the homestead for the paddock. *Journal of Rural Studies, 36*, 318-327.

Haynes, C. (2015). The value of work and 'common discourse'in the joint management of Kakadu National Park. *The Australian Journal of Anthropology*(2015), 1-16. doi:10.1111/taja.12169

Holmes, P. (2016). Rangeland pastoralism in northern Australia: change and sustainability. *The Rangelands Journal, 2015*(37), 609-616. doi:http://dx.doi.org/10.1071/RJ15051

Howlett, M., Gray, M., & Hunter, B. (2016). Wages, government payments and other income of indigenous and non-indigenous Australians. *Australian Journal of Labour Economics, 19*(2), 53.

Hunter, B. (2016). Some statistical context for analysis of CDEP. *Better Than Welfare?: Work and livelihoods for Indigenous Australians after CDEP, 36*, 51.

Hunter, B., & Gray, M. (2016). The ins and outs of the labour market: Employment and labour force transitions for Indigenous and non-Indigenous Australians.

Leigo, S. (2015). Guest blog – Cows and technology in remote Australia.

Leigo, S., Brennan, G., Beutel, T., Gray, A., Phelps, D., Driver, T., & Trotter, M. (2012). *Overview of technology products for the beef industry of remote Australia*. Retrieved from Alice Springs: http://www.crc-rep.com.au/resource/CW009_PrecisionPastoralManagementTools_ProductReview.pdf

Leigo, S., & Driver, T. (2014). *Precision Pastoral Management Tools Project - Cattle & pasture performance data without the sweat!* . Paper presented at the Pastoral Beef Industry Profit Drivers & Innovation Field Da, Marree.

Leigo, S., Phelps, D., Brennan, G., Driver, T., & McLean, I. (2015). From concept to reality – developing new technology in remote Australia *Rangelands Journal, 18th Biennial Conference Papers*(2015), 1-5.

Lovell, J. (2016). Editorial. Learning Communities: International Journal of Learning in Social Contexts [Special Issue: Synthesis & Integration],. *The International Learning Communities Journal, 19*(April 2016), 2-5. doi:http://dx.doi.org/10.18793/LCJ2016.19.01

Lovell, J., & Zoellner, D. (in press). Other views of Northern Australian aspirations: pre-notions, ideologies and remoteness. In S. Harwood, R. Gerritsen, B. PRideaux, T. Brewer, L. Rosenman, & A. Dale (Eds.), *Northern Research Futures* (pp. np). Canberra: ANU Press.

Lovell, J., Zoellner, D., Guenther, J., Brouard, F., & McMurtry, J. (2016). Contemporary Aboriginal settlements: Understanding mixed-market approaches. In A. Taylor, D. Carson, P. Ensign, L. Huskey, R. Rasmussen, & G. Saxinger (Eds.), *Settlements at the Edge: Remote Human Settlements in Developed Nations* (pp. 246-269). Glouster, UK: Edward Elgar.

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy, 41*(6), 955-967.

Marshall, N., & Stokes, C. (2014). Influencing adaptation processes on the Australian rangelands for social and ecological resilience. *Ecology and Society, 19*(2), 14.

Marshall, N., Stokes, C., Webb, N., Marshall, P., & Lankester, A. (2014). Social vulnerability to climate change in primary producers: A typology approach. *Agriculture, Ecosystems & Environment, 186*, 86-93.

Martin, C. (2016). The sharing economy: A pathway to sustainability or a nightmarish form of neoliberal capitalism? *Ecological Economics, 121*(January 2016), 149-159. doi:10.1016/j.ecolecon.2015.11.027

Mathew, S., Lee, S., & Race, D. (2016). Conceptualising climate change adaption for native bush food production in arid Australia. *Learning Communities: International Journal of Learning in Social Contexts [Special Issue: Synthesis and Integration],, 19*(April 2016), np.

McRae-Williams, E., Guenther, J., Jacobsen, D., & Lovell, J. (2016). What are the enablers of economic participation in remote and very remote Australia; and how can we identify them? . *The International Learning Communities Journal, Special Issue: Synthesis, Cooperative Research Centre for Remote Economic Participation., 19*(April 2016), 6-25. doi:http:// dx.doi.org/10.18793/LCJ2016.19.02

Morrison, J. (2015). Northern Development: Embracing the Indigenous Difference [Press release]. Retrieved from http://www.nlc.org.au/media-releases/article/northern-development-embracing-the-indigenous-difference

Ninti One. (2014). Remote Australia Infographic. In N. One (Ed.). Adelaide: Ninti One.

Ninti One Limited. (2014). The Impacts. Advancing the lives of the people and protecting the landscape of remote Australia. In A. S. Ninti One Limited (Ed.), *Remote Australia Online, Ninti One,* . Ninti One Limited, Alice Springs.

Osborne, S. (2016). Cultural Capacity and Development; the case for flexible, interdisciplinary research in remote Aboriginal and Torres Strait Island communities. *The International Learning Communities Journal, Special Issue: Synthesis, Cooperative Research Centre for Remote Economic Participation., 19*(April 2016), np.

Pearson, C., & Daff, S. (2014). Female Indigenous entrepreneurship in remote communities in northern Australia. *Information Management and Business Review, 6*(6), 329-344.

ABC NEWS (Producer). (2016, 27 January 2016). *Noel Pearson addresses the National Press Club* [

Robinson, C. J., James, G., & Whitehead, P. J. (2016). Negotiating Indigenous benefits from payment for ecosystem service (PES) schemes. *Global Environmental Change, 38*, 21-29.

Sengupta, U., Vieta, M., & McMurtry, J. (2015). Indigenous Communities and Social Enterprise in Canada: Incorporating Culture as an Essential Ingredient of Entrepreneurship. *Canadian journal of nonprofit and social economy research, 6*(1).

Smith, A., & Raven, R. (2012). What is protective space? Reconsidering niches in transitions to sustainability. *Research Policy, 41*(6), 1025-1036.

Stoeckl, N., Stanley, O., Brown, V., & Stoeckl, W. (2007). *Regional Economic Multipliers in Australia's Tropical Savannas* (1920949178). Retrieved from JCU: http://researchonline.jcu.edu.au /19230/1/ Regional-Economic-Multipliers-in-the-Tropical-Savannas.pdf

Wallace, K., & Lovell, J. (2009). *Listen Deeply: Let These Stories in*. Alice Springs: IAD Press.

Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation. (2016). The Purple House Wellbeing Program. Retrieved from https://www.westerndesertdialysis.com/wellbeing/

Whiteford, P. (2015a). Tales of Robin Hood (Part 1): Welfare myths and realities in the United Kingdom and Australia. *Australian Review of Public Affairs, Digest*(September 2015), np. Retrieved from Australian Review of Public Affairs website: http://www.australianreview.net/digest /2015/09/whiteford.html

Whiteford, P. (2015b). Tales of Robin Hood (part 3): The long view–social policies and the life cycle. *Australian Review of Public Affairs, Digest*(3), np. Retrieved from Australian Review of Public Affairs website: http://www.australianreview.net/digest/2015/10/whiteford3.html

Woinsarski, J., Traill, B., & Booth, C. (2014). *The Modern Outback. Nature, people and the future of remote Australia*. Retrieved from The Pew Charitable Trusts: http://www.pewtrusts.org/en/research-and-analysis/reports/2014/10/the-modern-outback

Wolf, C. (1993). *Markets or governments: Choosing between imperfect alternatives* (second edition ed.). Cambridge, Massachusetts, London, England: MIT Press.

Woodhead, A., & Acker, T. (2014). *The Art Economies Value Chain reports: Synthesis*. Retrieved from Adelaide, SA: http://www.crc-rep.com.au/resource/CR004_AEVC_Synthesis.pdf

Woodhead, A., & Acker, T. (2015). *Productivity, income and gender: Aboriginal and Torres Strait Islander artists* (CRO12). Retrieved from Adelaide, SA: http://www.crc-rep.com.au/resource/CR012_ProductivityIncomeGenderAboriginalTorresStraitIslanderArtists.pdf

Wunan Foundation. (2015). *Empowered Communities: Empowered Peoples Design Report*. Retrieved from Canberra: www.empoweredcommunities.org.au.

Zoellner, D., & Lovell, J. (in press). National data: reflecting Northern Australian aspirations? . In S. Harwood, R. Gerritsen, B. Prideaux, T. Brewer, L. Rosenman, & A. Dale (Eds.), *Northern Research Futures* (pp. np). Canberra: ANU Press.