

## Innovation in Australian rangelands. A special issue from the 18th Biennial Conference of the Australian Rangeland Society

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**Abstract.** This special issue highlights organisational innovations and new insights about challenges of living successfully in Australian rangelands through a diverse set of papers from the 18th Biennial Conference of the Australian Rangeland Society. Key themes in the papers are collaborations for innovation and adapting to change. The papers indicate a shift to increased interdisciplinary and transdisciplinary research and greater diversity in the perspectives being voiced about rangeland futures.

Received 16 October 2015, accepted 27 November 2015, published online 22 December 2015

### Nudging innovation

‘Innovation in the Rangelands’ was the theme of the 18th Biennial Conference of the Australian Rangeland Society held in Alice Springs, central Australia, in April 2015. Papers in this special issue were developed by their authors from conference presentations taking into account insights that emerged in the lively discussions during the conference and the comments of independent reviewers. The focus of the conference was on innovative solutions to the challenges of living successfully in the very large parts of Australia where climate extremes, remote urban decision-making, and small isolated communities are common. Conference delegates had various ways of conceiving of and describing these regions: as the rangelands, the outback, remote regions, deserts, ‘the bush’ or ‘home’.

Innovation has been defined as the implementation of a new or significantly improved product, good or service, a new marketing method or a new way of organising knowledge, action or relationships (OECD 2005). Innovation is critical to the long-term prospects of any social-ecological system because of the need to adapt to changing conditions (Sumberg 2005). Generating innovation involves flows of knowledge (both formal and tacit), finance, materials and labour inputs across many stakeholder groups (Hall and Clark 2010). Although research can be an important input for innovation, innovation is not driven by research alone, but from people who have an underlying ambition for change and who share, collaborate and make use of knowledge, ideas and other resources. The papers in this special issue particularly highlight non-technological/organisational innovations – new ways of people working together, sharing knowledge and improving its accessibility and application – that

have resulted in new insights about emerging challenges. The papers also show that there is no easy resolution to the question of how enterprises, industries and institutions can be better configured for a prosperous and sustainable future for Australia’s rangelands. It is, however, clear that respect for the values and meanings that the land has for people needs to be part of any resolution, as Arrernte native title holders Mrs Patricia Miller and Ms Kirsty Bloomfield highlighted when they welcomed conference delegates to their traditional lands.

The Hon. Fred Chaney A.O., in the conference opening address (Chaney 2015), celebrated positive changes that point the way to good social, economic, cultural and environmental outcomes in the rangelands. In doing so he reflected on his long career in nurturing change from the racially segregated Australia of the 1960s. His experience has spanned advocacy for Indigenous voting rights in the early 1960s, through helping to establish the Aboriginal Legal Service of Western Australia in the 1970s. He served as Federal Minister for Aboriginal Affairs 1978–1980, as a Deputy President of the National Native Title Tribunal, founding chair of Reconciliation Australia, and as chair of the Board of Desert Knowledge Australia and the Board of Central Desert Native Title Services. Chaney described innovation in institutions – that is, in the ‘rules of the game’ or the way things are done – that started from chance meetings between diverse individuals and developed momentum from persistent and strategic ‘nudging’ for change. He illustrated how leadership and tireless action from Indigenous people and their collaborators have been powerful forces for transformational social change. Chaney urged the peoples of the rangelands to continue to ‘nudge’ positive changes because these are strongly in the national interest.

### Who is engaged? Decadal changes

Networks with people who have different knowledge and ideas, and who may potentially bring new perspectives and access to resources, are important to foster innovation and effective adaptation to changing conditions. The conference epitomised the diverse networks that underpin the emergence of innovation. Delegates were from governments at state/territory and national levels, universities and other research organisations, livestock industries, Indigenous land-owning groups, natural resource management boards, mining corporations and small businesses. Spread of knowledge and extension of insights and learnings beyond the 350 conference delegates was promoted through social media, reaching an audience of 900 000 worldwide, and through digital recordings of selected papers (available at ARS 2015).

Comparison of the characteristics of delegates to the 2015 Conference and those who participated in the 13th ARS Conference, held a decade earlier (2004) and also in Alice Springs, indicates changing networks, interest groups and, probably, influence. Government employees (including extension, research and policy) and researchers (from universities and the CSIRO) were the biggest occupational/interest groups at both the 2015 and 2004 conferences but had decreased from 65% of delegates in 2004 to 45% in 2015. The proportion of conference delegates who are livestock producers also decreased by 30% between 2004 and 2015. Increases of 60–90% were apparent in other occupational/interest groups, notably Aboriginal people and organisations, natural resource management boards, and community or private sector organisations that are not focused on livestock production. Delegates from the mining and energy industries participated in the 2015 conference, unlike the 2004 conference. Women were 38% of delegates in 2015 and delivered 44% of papers, which was higher than in 2004 but not significantly so.

Differences in participation in the two conferences reflect broader social, economic and institutional changes that the Australian rangelands have experienced as part of regional economic differentiation and post-productivist transition (Holmes 2002). Consistent with this, the 2015 conference continued a trend to diversification in research agendas and increased interdisciplinary and transdisciplinary research. It encompassed issues for community sustainability, Aboriginal land management, the mining sector, wildlife conservation, remote service delivery and governance as well as livestock production. Papers in this special issue reflect much of this range.

The papers in this special issue represent something of the shift in whose voices are being heard in conversations and contestations about the Australian rangelands. Aboriginal land management capacity grew considerably in the decade since 2004 through public and private investments (Hill *et al.* 2013). In 2015, these resources were being applied by rangeland-focused Aboriginal organisations to employ hundreds of Aboriginal people as community-based rangers and to engage specialised expertise for biodiversity conservation and management of natural and cultural resources. Whereas including a themed session on Aboriginal land management in the 2004 conference was an innovation, projects and other initiatives in which Aboriginal people and organisations have leadership roles (e.g.

Jupp *et al.* 2015; Nursey-Bray and Arabana Aboriginal Corporation 2015) were featured in almost every session at the 2015 conference. Consistent with trends in international agricultural innovation (World Bank 2006), the private sector role in knowledge, information and technology has also become increasingly important in rangeland livestock production as exemplified by Holmes' (2015) contribution to this special issue.

### Collaborations for innovation

Partnerships and other collaborations in applied research are an important setting for innovation and were prominent in the conference. For example regional natural resource management boards have grown their capacity over the past decade, becoming active in leading research in their sphere and engaging specialist research expertise as required. The processes of knowledge sharing and brokering that are critical for innovation are epitomised in this special issue in the paper by Healy *et al.* (2015). It describes how natural resource management boards from across the Australian rangelands collaborated with researchers to ensure that the best science on climate change and its implications was available to support their planning. The full-time work of a knowledge broker was critical to ensuring effective communication, coordination and stakeholder engagement throughout the project, which allowed the development of knowledge products that were trusted by stakeholders and used in planning.

Development of effective knowledge systems for sustainable management of natural resources needs to start with the definition and framing of issues (Cash *et al.* 2003). Considerable challenges remain for incorporating Indigenous people's perspectives equitably in this framing. Melissa Nursey-Bray and her collaborators, Arabana people of the Kati Thanda-Lake Eyre region of South Australia, are addressing this challenge in relation to the most valued and contested resource in arid rangelands, water. Here Nursey-Bray (2015) reports Arabana perspectives on the health of water bodies and on indicators of water body health. She discusses how governance of knowledge, values and cultural memory underpin Arabana assessments of the condition of their country. She concludes that innovation in management systems will be important for effective engagement of Arabana water knowledge, through adaptive collaborative management that brings Arabana and other people together in iterative deliberative processes that guide planning and action.

New partnership configurations can emerge when these kinds of knowledge brokering processes reveal common interests and suggest common goals. Tony Jupp *et al.* (2015) provide an example of how such a partnership is spanning scales from global to local across Indigenous, conservation and mining sectors. They describe the activities and outcomes from the partnership between Martu people, who own and live in spinifex deserts in inland Western Australia, and The Nature Conservancy, a not-for-profit organisation founded in and managed from the USA. The partnership, which has been enabled by resources from the largest global resources corporation, BHP Billiton, is itself an innovation. It is enabling the Aboriginal owners of a vast area of Australia with high

biodiversity and cultural values to implement management that reflects the partners' shared agendas, which include supporting sustainable livelihoods for Martu people on their vast desert lands.

### Adapting to change

Flexibility in adaptation is particularly important in the rangelands given the variability and unpredictability of key characteristics such as rainfall, policy and markets and the very great impact of this variability on rangeland environments, and social and economic activity (Stafford Smith 2008). Adaptation is a strong theme in several of the papers in this special issue, with perspectives covering different contexts. Robertson and Blackwell (2015) engage with the challenges for adaptation where regional populations are dependent for services on towns which do not have a long-term future because their dominant industry – mining – exploits a finite resource. They highlight planning as a central requirement for regional adaptation, critical for the livelihoods and industries in the regions around the South Australian rangeland towns of Leigh Creek, in particular, and Roxby Downs. Statistical testing of dependency between the towns and non-urban regional populations is an analytical innovation in the paper.

Carmichael (2015) also engages with planning for adaptation, in a very different context to Robertson and Blackwell (2015) and in a domain that has had very little attention: addressing climate change impacts on Aboriginal heritage sites such as rock paintings, shell middens, sacred trees and spiritually significant landscape elements. As part of action research concerned with empowering Aboriginal people to manage these impacts, Carmichael (2015) reports on the design of the initial stage of a 'bottom-up' planning process. Results from the qualitative research he has undertaken with Aboriginal land management groups show that perceptions of climate change impacts and traditionally-held cultural responsibilities are motivators for these groups to plan for action to ameliorate impacts.

In the pastoral sector, Holmes (2015) is frank in his assessment that only 20% of beef producers are operating financially sustainable businesses. A substantial number of innovations have had positive impact on rangeland livestock production in the past 40 years, for improved herd productivity and more efficient communications, transport and livestock management. However, financial sustainability of producers has not improved. Holmes (2015) assesses the problem as being, ultimately, attitudinal. Rather than blaming others and appealing for help for problems that arise, he argues that producers need to improve their business skills and strategies.

Nadine Marshall's research arrives at a similar conclusion to Holmes (2015), yet via a different pathway. She has found that adaptive capacity is in very short supply among beef producers in the northern rangelands (Marshall 2015). This is of particular concern given climate change trajectories in Australian rangelands (Healy 2015) and because beef producers, like other people whose livelihoods are highly dependent on natural resources, are likely to be especially vulnerable to climate change impacts. Marshall (2015), like Holmes (2015), highlights practical ways that producers can increase their adaptive capacity. She indicates the importance of active sharing and

development of knowledge and networks through producers practising adaptive management, developing a culture of collaborative learning with other people, and making partnerships with community health and finance services. Positive impacts on adaptive capacity can be expected to result from the direct impacts of these actions on social and economic networks, environmental observation and awareness, use of technology and income diversity.

The paper of Dick Kimber and Margaret Friedel (Kimber and Friedel 2015) is a pertinent reminder of the importance of regional specificity and a critical stance in the design of environmental management strategies. They point out that understandings of the ecological role of fire in arid Australian rangelands have come largely from the north-west, including the Martu lands where Jupp *et al.* (2015) are working and where anthropogenic burning maintains small-scale habitat mosaics that promote habitat diversity and increase small-animal hunting efficiency (Bliege Bird *et al.* 2008). Aboriginal land management practices were less terminally disrupted by European colonisation in those spinifex-dominated sandy deserts than in most other Australian rangelands because the land was largely unsuitable for livestock industries. Historical accounts are particularly vital sources in regions where there is little or no living knowledge of how Aboriginal people used fire for hunting and habitat management. They can enable innovations for sustainable land management to take better account of past practice. Kimber and Friedel (2015) present the earliest documented observations of smoke and fire in the Lake Eyre Basin, made by Europeans who traversed this vast region before pastoralists brought sheep and cattle. They conclude that, although mosaic burning did occur in specific circumstances across this vast catchment, (which encompasses ~20% of Australia's rangelands), the evidence does not support a conclusion that it was a universal practice. Their analysis points to the opportunities for sound application of historical knowledge to inform adaptation in environmental management.

### Looking to the future

Papers in this special issue span Australia's rangelands from the most arid deserts to the monsoonal north. They engage with the underlying conditions for innovation in the rangelands – temporal and spatial variability, sparse populations, patchy and often low productivity, and diversity in values. They contribute to the theme of innovation in the rangelands through the originality of their approach and by encouraging new communities of interest to develop around the issues they describe. As a collection, the papers indicate opportunities and prospects for filling some of the many gaps in knowledge of how the societies, economies and ecology of Australian rangelands are structured, function and inter-relate. They also tell of the vibrancy, passion and depth of knowledge and capacity that is being applied to address these gaps.

How can these dimensions of innovation contribute to addressing the challenges of living successfully in Australian rangelands? In the final paper in this special issue, Bruce Walker (2015) argues that transformational change in institutions is critical for sustainable rangeland futures. Walker's view is founded in his long-term experience in innovating through his

leadership role of the national-scale Indigenous science and technology organisation Centre for Appropriate Technology and in policy analysis directed at establishing principles for effective governance in regions of Australia that are remote from cities and towns. Walker reminds us that the future of the small proportion of Australians who live in the rangelands lies in the hands of the wider Australian population, that their circumstances and challenges are totally different to those of the rangelands' people, and that they are largely indifferent to what might happen in rangelands.

Walker reflects on the perspective that is common among rangelands people: that they do not get a say in decisions that affect their lives and feel excluded from the greater Australian narrative. Indeed, concerns of rangelands people that are highlighted in many special issue papers have had little or no consideration in the policy for developing northern Australia announced in mid-2015 (AG 2015). Gaps in that policy include 'soft' infrastructure for networking and collaboration among dispersed and diverse people (Healy *et al.* 2015); design of processes that equitably engage Indigenous people (Carmichael 2015; Jupp *et al.* 2015; Nursey-Bray and Arabana Aboriginal Corporation 2015); regional planning for post-mining futures (Robertson and Blackwell 2015); addressing poor financial sustainability and low adaptive capacity among northern beef producers (Holmes 2015; Marshall 2015); and climate change (Carmichael 2015; Healy *et al.* 2015).

There are many reasons for such omissions, including the broad scope of northern development policy, which aims to guide investment across multiple sectors. Policy attention is focused on areas north of the Tropic of Capricorn and on development opportunities in cities and through irrigated agriculture in catchments of river systems that drain Australia's northern coastline. In the balance of the northern Australian rangelands, the low rainfall and very high evaporation mean that prospects for irrigated agriculture, and associated expansion of employment and trade, are very limited (Petheram *et al.* 2014), as is policy attention.

Developing the north thus falls far short of being a vision that encompasses all of Australia's rangelands. Nor does it embrace opportunities that are outside the ambit of market economics and that respect and add value to the interconnections between people, place and livelihood that characterise much of the Australian rangelands. Walker (2015) argues that disruptive and innovative radicalisation and structural change to governance are needed in order to develop a vision that rangelands people share, and to improve social cohesion, change the dynamic of underdevelopment, and re-ignite and sustain investment. The 18th Biennial Conference of the Australian Rangeland Society and the papers contributed from the conference to this special issue indicate there is strong aptitude and appetite for ongoing innovation and change, for helping Australians to better appreciate their rangelands, and continuing to move rangelands people and landscapes towards sustainability.

### Acknowledgements

Margaret Friedel chaired the Program Committee of the 18th Biennial Conference of the Australian Rangeland Society. We are grateful for her efficient and timely help and advice including identifying prospective

contributors and innovative contributions. Andrew Ash and Kate Forrest's insightful summary of conference themes, published in the *Range Management Newsletter* vol 15, no. 2, helped us to identify common themes among the diverse special issue papers. We thank reviewers of this and other special issue papers for their valuable and timely critique.

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