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The Rangelands Living Skin project: lessons for co-designed, collaborative research in rangelands

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Abstract

The value of conducting research with multidisciplinary and inter-disciplinary teams, involving both researchers and practitioners to develop problem-orientated and solution-focussed research is well recognised. 'Rangelands Living Skin' was a five-year project linking producers, scientists, education and extension agencies, commercial carbon companies and communications experts to evaluate cost-effective practices that focused on regenerating the New South Wales (NSW) rangelands in Australia, and supporting productive, profitable and sustainable businesses. The project brought together 12 project partners, plus additional expert consultants. The project aimed to create an evidence-base and build capacity for widespread adoption of practices that benefit soil, plants, animals and people – the living skin of the rangelands. Collaboration and co-design were at the core of the project, which took a farmer-centric approach. Producers from four grazing enterprises in western NSW were involved in all aspects of project design and delivery. An additional 26 producers were also signed up as 'observers', attending project events, collecting data across their own properties and creating a community of like-minded pastoralists in western NSW. Benefits of this approach included improving the breadth, robustness and relevance of the scientific research, bringing together diverse experience and perspectives, connecting stakeholders and increasing the project reach, producer engagement and participation. However, this approach was not without challenges, including increasing project complexity and scope creep, managing varying expectations of different partners, maintaining engagement and balancing the need for scientific design and rigor with practicalities of producer priorities and the environmental context. Key findings and recommendations from the Rangeland Living Skin project in undertaking collaborative, co-designed research for successful producer engagement, industry collaboration and adoption of research outcomes in rangeland grazing systems are discussed.

Introduction

The rangelands of New South Wales (NSW), Australia consist primarily of privately managed extensive grazing enterprises on native grass and shrublands that receive on average less than 500 mm rainfall per year. Historic overgrazing, uncontrolled total grazing pressure (TGP) and drought have collectively led to widespread soil degradation, erosion, loss of perennial grasses, poor landscape function and a loss of productivity across the region (McKeon et al. 2004). These drivers reduce community, business and landscape resilience, and as result, producers are looking for cost effective solutions to regenerate their resource base and remain viable into the future. Rangelands Living Skin (RLS) was a five-year project linking producers, scientists, education and extension agencies, commercial carbon companies and communications professionals

to explore and evaluate cost-effective practices that focused on regenerating the NSW rangelands and provide support to enable livestock businesses to be productive, profitable and sustainable. The project aimed to create an evidence-base and build capacity for widespread adoption of practices that benefit soil, plants, animals and people – the living skin of the rangelands.

The value of conducting co-designed collaborative research, involving both research and practitioners to develop problem-orientated and solution-focussed research is well recognised (Mauser et al. 2013, Moser 2016). It has been a successful approach in projects in Australia (e.g., Price & Hacker 2009, Bridle & Price 2009) and internationally (e.g., Wilmer et al. 2022), increasing stakeholder engagement and connecting a diverse network of stakeholders to achieve a common objective, although the challenges of this approach are also recognised (Wilmer et al. 2022, Bridle & Price 2009). This paper outlines the co-design approach of the RLS project, the key outcomes of the project and provides recommendations in undertaking collaborative, co-designed research for successful producer engagement, industry collaboration and adoption of research outcomes in rangeland grazing systems.

Co-design approach and review method

The RLS project was co-designed, with project objectives, activities, deliverables, methods and data collection developed in consultation with 12 project partners. This approach was intended to ensure relevance and practicality of project objectives and deliverables and maximise adoption of learnings by producers in Western NSW rangelands. At the centre of the project was the involvement of four 'core' producers who approached the researchers and/or were identified through project partners with a common goal of achieving environmental, business and productivity outcomes across their properties. The producers collaborated with the project team to identify, implement and monitor practices they decided would be beneficial to achieving the goals they set for their property. Methods to monitor and evaluate the success of management interventions and practices were developed to ensure outcomes of interest to producers were measured and reported on. Where possible, the core producers were involved in the establishment of trials, collection of data and photo points following trial installation, and in communication of trial results through field days, newsletters, scientific publications, case studies, project milestone reports and the final project report. Other project partners included Resource Consulting Services, Western Local Land Services, Australian National University, CarbonLink, Select Carbon, Soils for Life and Meat and Livestock Australia. The project engaged producers from an additional 26 livestock production businesses in western NSW to build their capacity and support their decision-making regarding adoption of practice change on up to 1M ha of grazing land in western NSW. These producers were involved through data collection and monitoring across their own properties, training, online discussions with subject matter experts and field days.

Research trials were established to investigate effects of management interventions identified as areas of interest by the producers for their context and goals, with support of the project team. Interventions included water ponding, deep ripping, intensive short-duration animal impact, gypsum, soil biological stimulants, hard-seeded annual legumes and mixed-species cropping. Additional monitoring investigated the effects of planned grazing management on ground cover, soil carbon dynamics and relationships in rangeland grazing systems, soil chemistry constraints in NSW rangelands, ground cover trends across NSW rangeland grazing systems, rangeland grazing business profitability, and greenhouse gas emissions from rangeland livestock enterprises.

Over the life of the project, the project hosted 17 in-person field days and workshops on a variety of topics relevant to the project theme, including soil carbon, soil biology, soil monitoring, ground cover, grazing management and natural capital. Additional online workshops, webinars and recorded videos were hosted through the project on a broad range of topics and further extension to a broader audience was achieved via fact sheets, newsletter and media articles, presentations and social media.

Towards the end of the project, a survey to all project partners was distributed to collect feedback on the key successes, challenges and recommendations going forward of the collaborative, co-design approach and the outcomes of the project. 14 responses from 10 of the project partners were received. The findings were further

discussed through three focus meetings with the project partners to refine this feedback into key learnings and recommendations, with all project partners provided the opportunity to provide further review and input via email and shared online documents. During this review and from trial and learnings throughout the life of the project, project partners documented key factors for engaging producers in research, development and extension activities in NSW rangelands.

Outcomes and learnings from RLS for collaborative research

Overwhelmingly, project partners considered the RLS a success and identified value in structured and meaningful producer collaboration throughout the project, from inception to delivery, as well as the broad skillset provided through partner organisations. Benefits of this approach included improving the breadth, robustness and relevance of the scientific research, bringing together diverse experience and perspectives, connecting stakeholders and increasing the project reach, producer engagement and participation. Key outcomes of the RLS project included:

- Enhanced producer awareness and capacity building related to management and monitoring of soil, pastures, biodiversity, landscape function, productivity and profitability in rangeland grazing systems
- Improved collaboration and knowledge exchange between producers, researchers and industry stakeholders in the NSW rangelands
- Scientific evidence demonstrating the efficacy of management practices and enhanced understanding of relationships between carbon and environmental variables in data-poor rangeland areas
- Demonstration of environmental, productivity and profitability outcomes of management practices in NSW rangeland grazing systems

Project partners also identified learnings, considerations and challenges of this expansive project team and producer-centric approach, including: 1) an ambitious project scope designed to be multi-disciplinary but which at times led to a lack of clarity and accountability, and was constrained by time and financial resources; 2) at times, limited producer engagement and participation in project activities due to competing events, long distances, low populations, and workload priorities; 3) external factors such as COVID-19 or floods which challenged momentum of the project; and 4) managing expectations of a large and diverse project team, at times with participants pulling in different directions in regards to the delivery of project activities and communication of project outputs. Key to overcoming these challenges was regular, open and respectful communication, recognising the skills and knowledge that stakeholders bring to the project team and taking a participatory approach to all project activities, including in the planning of events and development of project outputs.

Key 'success' factors in fostering producer engagement

Due to the large areas of land managed by producers, and the low population density in this extensive environment, it is critical that rangelands research, development and extension (R, D & E) actively, intentionally, and successfully engages producers to optimise value and potential adoption. At the conclusion of the RLS Project, the following recommendations were developed by the project team which includes the core producers to outline key strategies to foster meaningful engagement with producers, thereby enhancing the overall impact and value of collaborative projects.

→ **Set realistic and achievable R, D & E objectives** and priorities with both producers and industry
→ **Co-design** R & D projects with producers and industry stakeholders to ensure activities are relevant, practical and of interest to target audience and end users of information
→ Outline a **clear value proposition** for producers, including the project outcomes that will be of value to them and their business, now and in the future
→ **Engage producers in all aspects of project**, encouraging active participation and contribution and practical feedback (including project development, monitoring, hosting events, presenting results, reviewing project outputs)
→ **Incorporate producer knowledge** and feedback into project design, activities and outputs

- → **Value the time, expertise and contribution** of producers in the project team, including payment for time and services, ensuring equal partnership and ownership and clear accountability
- → Establish research and demonstration sites **'on the ground'**
- → **Encourage producer-led initiatives** and peer-peer learning. Where possible, have producers present and talk to the experience and results of projects on their property
- → **Highlight success stories, make the research accessible and showcase** R, D & E findings via multiple avenues including field days, workshops, media articles, case studies, podcasts and webinars, to increase reach and engagement
- → **Work with existing producer-led groups** or establish enduring producer networks that collaborate on multiple initiatives to ensure longevity beyond short-term projects
- → **Time events** to avoid 'busy' periods in the production calendar, avoid conflicts with other events, and plan ahead to 'save the date'
- → **Personal connection** is important – ensure regular one-on-one communication between the project team, industry and producers
- → **Provide opportunities for connection** between producers and with industry experts
- → **Provide summary of research or project results** and project data to producers in a timely manner and meaningful and practical format

Conclusion

The Rangelands Living Skin project demonstrated the potential for and application of co-designed, collaborative research and extension to understand and promote management practices that can achieve ecosystem sustainability, productive landscapes and profitable businesses in a semi-arid rangeland environment. The project highlighted the value of producer involvement in all aspects of project design and delivery, alongside a diverse team of stakeholders, and their role in promoting and communicating project findings to support wider adoption beyond the project participants. Engaging producers is critical in maximising the impact of research. Producer participation in R, D & E can be encouraged by ensuring there is a clear value proposition and the project outcomes are relevant to producer needs, valuing the time, knowledge and services provided by producers in the project team, supporting producer-led initiatives and ensuring local support and research activities.

Developing and delivering collaborative R, D & E is not without challenges; however, projects will be more successful if they have a clear project scope and deliverables that are developed collaboratively with all project partners, with regular open communication, flexibility in the delivery of project activities and ensuring sufficient time and budget to achieve project objectives. As political and industry R, D & E priorities and associated funding avenues change, there is an increasing need for a strong value proposition and co-investment by stakeholders to support continued R, D & E in the rangelands. New work will need to consider and facilitate links to First Nations people and would benefit from incorporation of indigenous knowledge and management. Furthermore, future R, D & E would benefit from connecting rangeland regions (across borders, e.g., NSW, QLD, SA, WA), bringing together investment under unified programs of work and sharing information and learnings across broader networks with similarities in production systems. Rangeland grazing systems are a unique and valuable asset for both livestock production and natural capital in Australia. By fostering strong, collaborative relationships among producers and other stakeholders for R, D & E and striving to meet the key principles and strategies for collaborative R, D & E we can drive meaningful progress towards a collective rangelands vision.

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References

Price RJ, Hacker RB (2009) Grain & Graze: an innovative triple bottom line approach to collaborative and multidisciplinary mixed-farming systems research, development and extension. *Animal Production Science* 49, 729-35.

Bridle KL, Price RJ (2009) Undertaking participatory research at a national scale: the Biodiversity in Grain & Graze approach. *Animal Production Science* 49, 916-27.

McKeon GM, Hall WB, Henry BK, Stone GS, Watson IW (2004). Pasture degradation and recovery in Australia's rangelands: Learning from history. Queensland Department of Natural Resources, Mines and Energy.

Moser SC (2016) Can science on transformation transform science? Lessons from co-design. *Current Opinion in Environmental Sustainability* 20, 106-15.

Wilmer H., Schulz T., Fernández-Giménez ME, Derner JD, Porensky LM., Augustine DJ., Ritten J, Dwyer A, Meade R., 2022. Social learning lessons from collaborative adaptive rangeland management. *Rangelands*, 44, 316-326.