

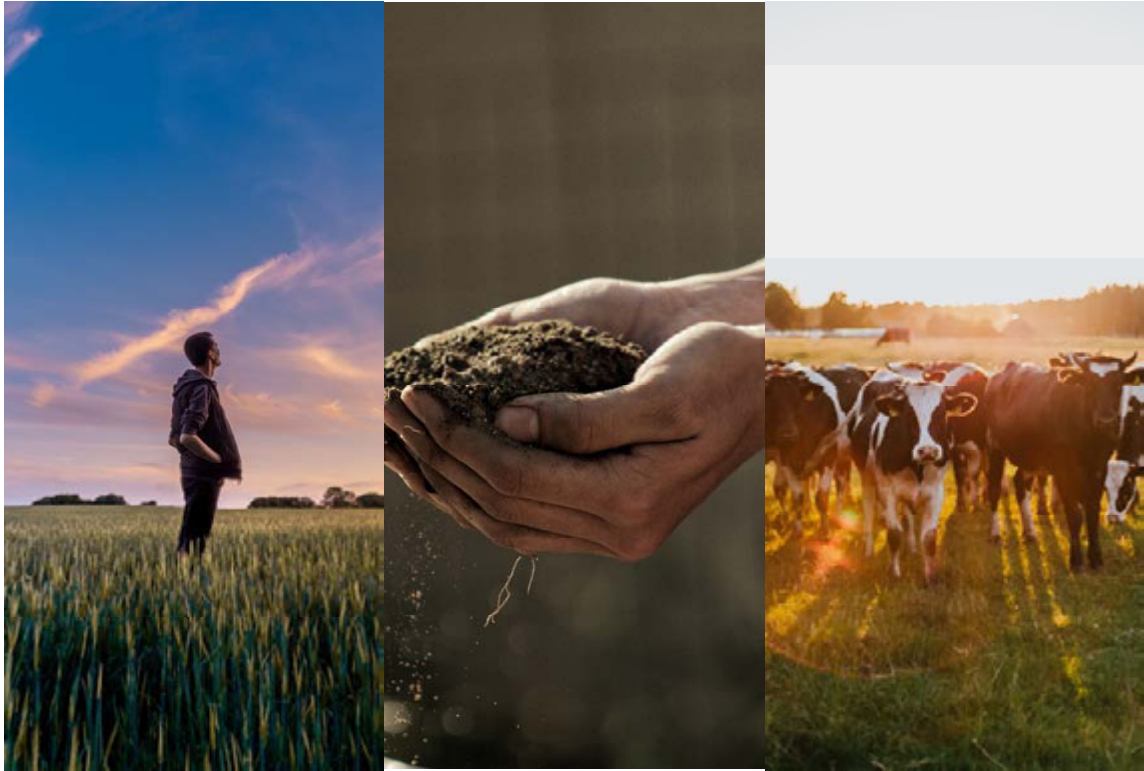
Southern NSW Drought Resilience Adoption and Innovation Hub

Submission to the

Productivity Commission

**Inquiry into the effectiveness, efficiency and appropriateness of Part 3 of the
Future Drought Fund Act 2019.**

This submission is to be read in conjunction with the Impact Pathway and Case Studies provided alongside this submission.



The Southern NSW Drought Resilience Adoption and Innovation Hub

Charles Sturt University is the host of the Southern NSW Drought Resilience Adoption and Innovation Hub (the Hub). The Hub is one of eight hubs being established across Australia to combat drought and form the epicentre of user-driven innovation, research and adoption and facilitate transformational change through the co-design of research, development, extension, adoption and commercialisation (RDEA&C) activities

Along with Charles Sturt, the has seven partners: The Australian National University, Farming Systems Group Alliance (consisting of 9 local farming systems groups), NSW Local Land Services, NSW DPI, Rural Aid, University of Canberra and University of Wollongong (UoW).

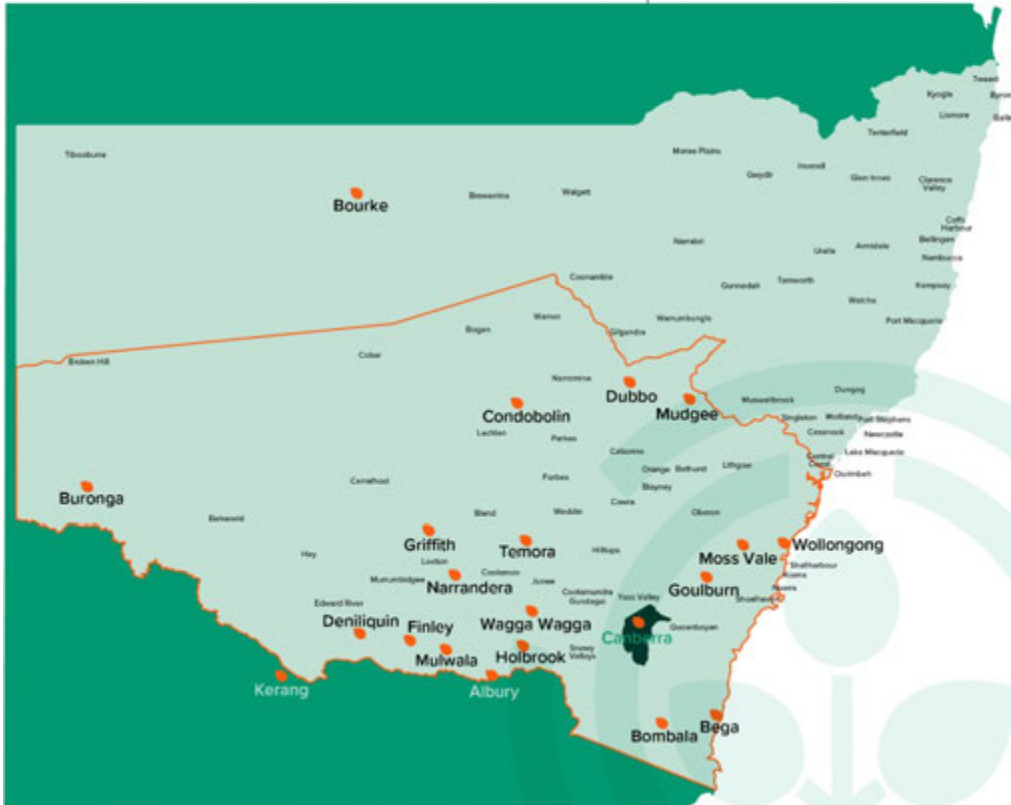
The centrepiece of the Hub is its Knowledge Broker Network, which comprises 31 members (representing just over 11.5 FTE) who are based across the Hub footprint (see map below). These Knowledge Brokers are working with their communities to identify the major opportunities and barriers to drought resilience. Through the process of co-design, they are formulating targeted activities that respond to these opportunities and barriers. The Hub is investing over \$3 million in the network and co-design processes to develop impactful drought resilience projects.



SOUTHERN NSW
Innovation Hub

SUSTAINABLE AGRICULTURE,
LANDSCAPES AND COMMUNITIES

KNOWLEDGE BROKER NETWORK



Knowledge Brokers can be found in these districts:

- Albury
- Bega
- Bombala
- Bourke
- Buronga
- Canberra
- Condobolin
- Deniliquin
- Dubbo
- Finley
- Goulburn
- Griffith
- Holbrook
- Kerang
- Moss Vale
- Mudgee
- Mulwala
- Narrandera
- Temora
- Wagga Wagga
- Wollongong



SOUTHERN NSW
Innovation Hub

SUSTAINABLE AGRICULTURE,
LANDSCAPES AND COMMUNITIES

Hub Objectives

With its partners and Board, the Hub established the following objectives:



CREATE approaches to engagement, adoption and commercialisation that are modern, relevant and effective in enabling sustained change

CONNECT people and organisations across geography, cultures and farming enterprises to create a skilled, flexible network able to identify and solve the challenges and opportunities facing agriculture and agricultural focused landscapes and communities now and in the future



BUILD agricultural and community engagement, extension, adoption and commercialisation capacity in SNSW so that the knowledge and tools required to adapt to current and future conditions are available where and when required

SUPPORT people and organisations to adopt appropriate new technologies, resources, ideas and systems in an efficient and sustained way



ATTRACT investment into priority projects, activities, and programs in SNSW so that existing knowledge is adopted and the new knowledge that is needed is created and adopted

Outcomes to date

The main outcomes achieved in the short period of time that the Hub has been operational fall into:

- Capacity building – Developing a people centric design process bespoke to agricultural motivation in Australia; training of extension staff in values-based engagement and co-design; supporting staff to develop those skills
- Collaborations – The Hub has demonstrated increased numbers and quality of collaboration and networks working to deliver drought resilience and innovation in SNSW, specifically:
 - Farming Systems Groups Alliance brought together for the Hub
 - National Hub network
 - Hub partner collaborations
- Priorities and opportunities – Through the work of the Knowledge Broker Network, the baselining drought project and the ideas forums we have held we have identified a range of issues and opportunities for effort and investment in SNSW. These priorities are reproduced in full at **ATTACHMENT A.**
- Attracting Investment – The Hub has attracted an additional **\$11,527,838** in new investment for partners and stakeholders in SNSW (see table below).

Supporting evidence for these outcomes can be found in the **Impact Pathway and Case Studies** provided alongside this submission.

Climate resilience

The establishment period of the Hub coinciding with successive La Nina seasons and widespread flooding which has been disastrous for many primary producers and communities. This has presented some challenges in trying to engage on the topic of drought resilience. However, we've tried to take a broader view, recognising that drought is one of a suite of climate variations/adverse outcomes that can present itself, and that activities that build resilience and the capacity for adaptation help buffer farming business and rural communities for a range of climatic possibilities.

We would therefore support a change in scope of the Future Drought Fund that broadened its remit to support resilience to climate change. However, we do note that, notwithstanding recent events, drought still remains a key challenge for producers and communities to manage and should be a front and centre priority for the Fund.

Additional investment attracted

We believe one of the core roles of the Hub is to attract additional investment into Southern NSW for projects that build drought resilience and rural innovation more broadly.

The Hub received an initial \$8m of funding from the Future Drought Fund, which was coupled with \$900,000 of partner cash contributions and nearly \$11m of in-kind contributions from partners. Since then, the Hub has secured the following additional investment.

Project	Source	Amount
National Risk Management Initiative – Action Research Group lead	<i>Grains Research & Development Corporation</i>	\$3,822,135
Agricultural Innovation Hubs Program	<i>Commonwealth – Department of Agriculture, Forestry and Fisheries</i>	\$2,500,000
Adoption Officers	<i>Commonwealth – Future Drought Fund</i>	\$1,125,000
Saving Our Soils During Drought	<i>Commonwealth – Future Drought Fund - Drought Resilient Soils and Landscapes grant program</i>	\$1,000,000
Improved drought resilience through optimal management of soils and available water	<i>Commonwealth – Future Drought Fund - Drought Resilient Soils and Landscapes grant program</i>	\$997,600
Creating landscape-scale change through the promotion of resilient pasture systems	<i>Commonwealth – Future Drought Fund - Drought Resilient Soils and Landscapes grant program</i>	\$983,950
Building Landcare Community and Capacity, Soils Co-ordinator	<i>Commonwealth – Department of Agriculture, Forestry and Fisheries</i>	\$375,000
Drought Management for Health and Longevity of Perennial Horticulture Plants	<i>Commonwealth – Future Drought Fund – Cross Hub project</i>	\$250,000
Climate Coaching for on-farm decision making	<i>Meat and Livestock Australia</i>	\$190,820
Managing Rangelands for drought resilience	<i>Commonwealth – Future Drought Fund – Cross Hub project</i>	\$183,333
Improved drought resilience through optimal management of soils and available water (co-contribution to FDF project)	<i>Grains Research & Development Corporation</i>	\$100,000
	Total	\$11,527,838

Additional information on these Hub projects can be found at **ATTACHMENT B.**

Water management

Priorities

- Improve strategic decisions around allocation of irrigation water and optimise efficiency in delivery and use
- Optimise the efficient capture storage and use of surface water for agricultural production
- Balance agricultural water requirements with landscape and cultural water needs

Possible pathways to build resilience

- Exploration and development of efficient water management tools and techniques
- Assessment of current and future water availability and infrastructure and ability to most efficiently match that to production system needs at a farm scale

Regional communities

Priorities

- Understanding and managing the collective impact of drought on social aspects of rural communities
- Managing business risk to improve resilience of non agricultural businesses that rely on rural prosperity
- Addressing mental health in rural communities during drought
- Retaining populations to underpin regional services and social structures

Possible pathways to build resilience

- Rural regional community social research into pre-drought indicators in communities
- Supporting First Nations communities to develop diverse agricultural businesses and fill knowledge gaps
- Building resilience of businesses and social networks that underpin regional communities and service surrounding areas
- Identifying mental health indicators and service structures that can be sustainable for small communities

Planning and Preparedness

Priorities

- Improving farm business management skills and decision making capacity to manage risk and capitalise on opportunities
- Increase the reliability and accuracy of long range weather forecasting
- Servicing the complexity of skills required in modern farming enterprises

Possible pathways to build resilience

- Increasing the adoption and implementation of farm plans which identify opportunities to increase resilience and manage risk
- Understanding and managing farm business enterprise diversification risks and investment opportunities. Assessment and decision support tools and services.
- Identifying areas of deficiency in current preparation for drought and develop plans to address these
- Farm financial business management skills to support sound decision making
- Identified key trigger points or other tools to prompt timely, tactical decision-making during drought
- Improve landholder and advisor capacity to analyse and interpret climate and weather data

Agricultural Practices

Priorities

- Adoption of agricultural practices that optimise production benefits whilst managing risk to farm business and landscape assets
- Addressing regional workforce shortages

Possible pathways to build resilience

- Greater understanding and better utilisation of Stock Management Areas for production and natural asset conservation
- Addressing knowledge gaps associated with developing and improving management of drought resilient crop and pasture species with are fit for future climate
- Development of initiatives to attract and maintain workforces in regional areas
- Development and adoption of labour saving technologies and practices to reduce the reliance on human resources
- Building capacity in quality fodder production and storage

Landscape Management

Priorities

- Improving soil management practices to balance production with ecosystem services and avoid degradation during drought
- Capitalising on potential alternate income through natural capital accounting and valuing ecosystems services such as biodiversity and carbon

Possible pathways to build resilience

- Improving knowledge and adoption of practices that manage soils and landscapes as complex systems
- Improve understanding of key soils constraints and opportunities and development of management strategies to address
- Tools and skills development for farmers to support improved management of groundcover

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ADDITIONAL INVESTMENT ATTRACTED

Grains Research & Development Corporation - National Risk Management Initiative –

- **Action Research Group lead - \$3,822,135**
 - Lead collaborator – FarmLink Research
 - Collaborating partners – Agricultural Marketing and Production Systems (AMPS), Grains Orana Alliance, Central West Farming Systems (CWFS), Ag Grow Agronomy, Holbrook Landcare, Riverine Plains, Southern Growers, Irrigation Research and Extension Committee (IREC), Irrigated Cropping Council (ICC).
 - *The Hub will lead the Action Research Group (ARG) within NSW under GRDC’s National Risk Management Initiative.*

- **DAFF - Agricultural Innovation Hubs Program - \$2,500,00**
 - **Activity 1: Managing farming biosecurity risks**
 - Collaborating Partners - NSW DPI, NSW Wine, Plant Health and Animal Health Australia
 - *Develop regional biosecurity profiles, leveraging existing program logic for biosecurity surveillance.*
 - *Simulation Exercise involving producers, community, supply chains and responsible agencies.*
 - *Develop business model to support biosecurity EA&C systems across sectors and nationally*
 - *Deliver track and trace application, connecting NSW Wine (vineyard) biosecurity and apply to simulation exercises in demonstrating the value of biosecurity management strategies*
 - *Currently 20+ wine grape growers commenced and using the track and trace technology on their properties. At least another 30 expected to join.*
 - **Activity 2: Sharing early insights for more resilient communities**
 - Collaborating Partners - UC, ANU, UW, CSU
 - *This project will support rapid intervention through disaster cycles and will be a first (nationally) to develop early warning signals for changes in community resilience to better support rapid identification of risk before, during and after extreme climatic events. On-ground activities that will occur over the next 9 months include:*
 - *Rapid literature review on early warning signals in relation to maintaining resilience and maintaining financial and psychological wellbeing during and after challenging climate-related events and workshops with end users (e.g., local government, LLSs, NGOs etc) to identify early warning signals*
 - *Analysis of existing longitudinal databases, particularly Regional Wellbeing Survey database, for early warning signal data of resilience loss and identify new and innovative data to inform signals*
 - *Design a high-fidelity early warning signals proof of concept that demonstrates the value of the concept, using static data and a limited number of use cases to bring the concept to life*

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and help stakeholders determine whether to invest in developing the proof of concept into an operational prototype

Design rapid survey tool and test in communities that, based on existing data, are at differing points in time post an extreme climate event; Identify and work with data holders for the three potential 'big data' opportunities identified from workshops

- *Test options for rapid collection, processing, and reporting of information in an easy to access way. Implement rapid survey tool in communities*
- *Develop a Proof of Concept Resilience Early Warning Tool - data and analytics visualisation proof of concept. Includes Symposium to showcase and path to scale report*
- **Activity 3: Capturing value of AgTech innovation on-farm**
 - Collaborating Partners - CSU, Digital Farm, MLA, KPMG, LLS, NSW DPI, FSGA
 - The project will capitalise on MLA's Agtech calculator prototype to further develop its relevance for SNSW beef livestock producers. It will:
 - *Work with farmers and advisors to capture the true operating costs and opportunity costs of different livestock farm operations*
 - *Develop algorithms to calculate the costs saved or the value created of commercially available technology solutions*
 - *Create an easy-to-use online portal for farmers to input their own information to assess the value of different technologies in their own context*
- **FDF – Adoption Officers**
 - **Adoption Officers \$1,125,00**
 - Lead collaborator – NSW Local Land Services
 - Adoption Officers will be engaged or employed by LLS to ensure a strong focus on farmers as the customer and the uptake of the Future Drought Fund tools and drought resilience innovation at a localised, on-farm and community level.
- **FDF - Drought Resilient Soils and Landscapes grant program**
 - Southern NSW Innovation Hub **Saving Our Soils During Drought \$1,000,000**
 - Lead collaborator – Local Land Services
 - Collaborating partners – Holbrook Landcare Network, FarmLink Research, Central West Farming Systems, Riverine Plains, Soils Knowledge Network, Irrigated Cropping Council
 - *Saving Our Soils During Drought demonstrates and educates farmers about the use of Stock Management Areas (SMA) as a drought resilience strategy. This practice aims to improve drought resilience by maintaining groundcover across rested paddocks, so recovery from drought is quicker. The project includes practical, hands-on training, case studies, 20 field visits across 6 demonstration sites, 20 workshops, expert modelling and follow up support, provided to at least 400 farmers in Southern NSW.*

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- Southern NSW Innovation Hub - **Creating landscape-scale change through the promotion of resilient pasture systems \$983,950**
 - Lead collaborator - Holbrook Landcare Network
 - Collaborating Partners - FarmLink Research, Central West Farming Systems, Monaro Farming Systems, NSW DPI, Riverine Plains, Local Land Services
 - *Creating landscape-scale change through the promotion of resilient pasture systems will demonstrate modern pasture species combinations and management practices known to build drought resilience. These practices can potentially protect soils and support productivity during and following droughts across 82 percent of NSW land area. The project involves up to 10 demonstration sites and 5 farmer reference groups across the mid to high-rainfall zones of central and southern NSW. Outcomes of the demonstrations will be upscaled to farm and landscape scales using advanced modelling, ensuring regional applicability. Knowledge brokers will translate information to local audiences and support social learning between farmers. A series of workshops, publications, case studies and on-farm consultations with farmers will be also used.*

- Southern NSW Innovation Hub - **Improved drought resilience through optimal management of soils and available water \$997,600**
 - Lead collaborator - Riverine Plains
 - Collaborating partners - Central West Farming Systems, FarmLink Research, NSW DPI and Southern Growers, along with CSIRO and GRDC (contributing \$100,000).
 - ***Improved drought resilience through optimal management of soils and available water demonstrates practices from 3 farming system strategies that improve drought resilience. These non-conventional strategies include: Diverse legume rotations (to increase organic carbon, nitrogen and other soil elements), Early-sowing of slower-maturing crops (to increase water holding capacity) and Measuring residual nitrogen (to prevent excess application, increasing profitability & decreasing runoff into waterways). The project involves 12 demonstration sites with a broad range of soil types, environments and land uses across Southern NSW & North Eastern VIC. The sites span approximately 18 million hectares in NSW and VIC. Each demonstration site will hold 1 field day/year to showcase the demonstrated practices, reaching a network of around 3300 farmers. Outcomes will be communicated using 12 case studies and a range of communication channels. These are expected to reach over 10,000 community and agribusiness professionals.***

- DAFF - Building Landcare Community and Capacity
 - **Soils Co-ordinator \$375,000**
 - Lead collaborator – NSW DPI

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- The Hub through NSW DPI is hosting a regional soils coordinator to carry out activities in line with the Smart Farms Soil extension round and support the National Soil Science body to deliver the Community of Practice.
- **FDF - Cross Hub Collaborative Projects**
 - Managing Rangelands for drought resilience \$1,100,000
 - Lead collaborator - NWANT Hub
 - Collaborating partners – **SNSW Hub (investment \$183,333)**, SA Hub, SWA Hub, SQNNSW Hub, TNQ Hub
 - The SNSW Hub will establish a site to demonstrate and build confidence in rangeland regeneration tools and techniques, run a field day and gather baseline including qualitative data on pastoralists’ willingness to apply new digital tools and management systems in their businesses/
 - Drought Management for Health and Longevity of Perennial Horticulture Plants \$1,000,000
 - Lead collaborator - SA Hub
 - Collaborating partners – **SNSW Hub (investment \$250,000)**, Victorian Hub, Tasmanian Hub,
 - The SNSW Hub is establishing validation and demonstration sites for ag tech focused on remotely monitored soil moisture and canopy development in wine grapes and citrus; and interviewing almond and citrus growers participating in extension activities to gather baseline data and insights on current practices, and grower and industry-stakeholder attitudes and aspirations for adoption and commercialisation of long-term extension resources and ag tech.
- **Meat and Livestock Australia**
 - **Climate Coaching for on-farm decision making \$190,820**
 - Lead collaborator – Pinion Consulting
 - This project is the final stage of a five-year ‘Forewarned is Forearmed’ (FWFA) project, which developed five new Bureau of Meteorology forecast products for extreme events. A coaching/training program will be developed and piloted with 50 producers and up to 50 cross-sectoral advisors (min 30) in southern Australia on how use seasonal climate forecasts including the five climate products in on-farm decision making.
- **Stock confinement area – virtual tool**
 - The Hub [successfully launched](#) its [Stock Confinement Area \(SCA\)](#) virtual reality tool at the Henty Field Days. The tool has been highly acclaimed and will continue to be rolled out to encourage landholder adoption of SCAs for drought management.
 - The tool is available for desktop and mobile use and is also available through a specialised Virtual Reality (VR) experience for the Meta Quest 2 headset.
 - The project is a collaboration between the Hub, NSW Local Land Services and the eXtended Reality Centre (XRC) at CSU and was funded by the Hub at a cost of \$50,000.