RAIZ
Resilient Agriculture Investment for net-Zero land degradation

Case Study

Demonstration of bare ground restoration in the Southern Gulf Region: bringing drought-affected soils back to productivity, drought resilience and sustainability

Location: North West Queensland, Australia
Stage of Implementation: Demonstration / pilot, delivered from 2020 to 2024
Lead entity: Australian Government Department of Agriculture, Fisheries and Forestry
Contact information: droughtresilience@aff.gov.au

Mapping the problem

Australia is the driest inhabited continent, with drought a recurring feature of the landscape. Climate models indicate that future rainfall patterns are likely to change, with more severe droughts and extreme weather events. These impacts are already being felt across the agricultural sector and regional Australia, reinforcing the need for farmers, land managers and communities to strengthen drought preparedness and adapt to a changing climate.

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) indicates that future climate conditions could increase pressure on farms across Australia, including through more frequent droughts, extreme weather and shifting rainfall patterns. While productivity gains and adaptive practices have helped offset some impacts to date, the long-term sustainability of the sector depends on maintaining and improving natural capital.

Australian agriculture depends on a biodiverse and well-managed natural resource base. During drought, soil, water, native vegetation and wildlife are at heightened risk of degradation. Sound on-farm natural resource management can help reduce these risks, support recovery across the drought cycle, and deliver benefits for both agriculture and the environment.

The solution and approach

The **Future Drought Fund (FDF)** is a key investment by the Australian Government to provide funding for initiatives that support farmers and regional communities to build drought and climate resilience. The FDF invests in programs to help farmers grow and prepare their businesses for dry conditions, such as farm business resilience planning,

climate tools, and long-term trials of drought resilient farming practices. The Fund also supports agriculture-dependent communities by investing in strong local planning, networks and leadership – ensuring communities can stay resilient and thrive, even during dry times.

The FDF was established in 2019 with an initial investment of A$3.9 billion (US$2.5 billion). The earnings from this are reinvested, with the Fund reaching A$5 billion in December 2024. Each year, returns from the Fund are made available for FDF grants and programs to build drought resilience across Australia's agricultural sector, landscapes and communities.

The Drought Resilient Soils and Landscapes program was delivered from 2020 to 2024 under the FDF. The program demonstrated broad-scale land management practices to improve the drought resilience of agricultural land. More than A$23.1 million was invested through the FDF to establish 26 projects that helped farmers prepare for, respond to and recover from drought.

Case study

Demonstration of bare ground restoration in the Southern Gulf Region: bringing drought-affected soils back to productivity, drought resilience and sustainability

Delivered by Southern Gulf NRM Ltd

This project demonstrated techniques to restore bare ground and maintain permanent groundcover. It supported drought resilience by restoring and maintaining the grazing potential of land, including during drought. The project established 13 demonstration sites across 2 districts in North West Queensland, covering up to 4,000 hectares.

The demonstrations measured cost effectiveness, soil carbon build-up, grass recovery and productive capacity. Findings and knowledge were shared through field days and other channels. The practices demonstrated through the project may inform adoption across the estimated 1.5 million hectares of bare ground in North West Queensland.

The project was delivered through a partnership between landholders, Southern Gulf NRM, James Cook University and the Tropical North Queensland Drought Hub.

Designing costing mechanisms and financing structures

Southern Gulf NRM Ltd received A$667,500 in grant funding through the FDF Drought Resilient Soils and Landscape Program from 2020 to 2024. This public funding was supported by in-kind contributions from Southern Gulf NRM, James Cook University and participating land managers. No additional loans or blended finance instruments were reported.

The FDF grant funded the project's core delivery, including landholder engagement, demonstration site design, monitoring, forums, administration, reporting, staff training and limited on-ground works. Partner in-kind contributions strengthened delivery through technical expertise, research, communications and landholder support. The financial structure was grant-led, with partner contributions complementing delivery rather than forming a separate investment layer.

Financing was enabled by the FDF policy framework, which supports projects that build drought resilience through improved land management, monitoring and practice adoption. Delivery was further enabled by partnerships between Southern Gulf NRM, James Cook University, the Queensland Government Department of Agriculture and Fisheries (now the Department of Primary Industries), the Tropical North Queensland Drought Hub, the Northern Territory Department of Industry, Tourism and Trade, the University of Queensland and land managers. These partnerships brought soil science, land condition assessment, drone-based remote sensing and practical knowledge-sharing capability to the project.

Knowledge sharing and potential for replication

This case study shows that restoring drought-affected bare ground is both a technical and knowledge-based challenge. It demonstrates how soil chemistry, ground cover data, drone imagery, land condition monitoring and one-on-one engagement can help land managers distinguish between temporary bare ground, persistent degradation and constraints such as salinity and sodicity. This evidence base can guide future investment by identifying where restoration is likely to be effective, where natural recovery may be sufficient and where targeted intervention is required.

Scaling would require longer-term finance for monitoring, demonstration sites and landholder support, particularly where treatments such as gypsum, fencing, labour and earthworks are costly. It would also require ongoing partnerships with universities, Natural Resource Management bodies, government agencies and FDF drought hubs to maintain technical capability and translate soil science into practical guidance. Policy settings that support adaptive delivery would also be important, given rainfall, flooding, cattle prices and landholder priorities can shift quickly.

Lessons learned

Projects in rangeland systems require flexibility, as extreme rainfall and flooding can rapidly change site conditions and landholder priorities. The project also highlighted that

knowledge sharing, trusted relationships and clear communication of soil science can be as valuable as physical restoration works. Long-term monitoring is essential, as short-term increases in ground cover after rainfall do not necessarily indicate sustained improvement in land condition.

Key barriers

Key barriers included extreme weather, particularly flooding associated with ex-Tropical Cyclone Kirrily, which delayed site access and prevented some restoration works. Cost was also a significant barrier, with some treatments difficult to replicate across large areas while land managers were managing flood recovery, fencing repairs, stock movements and low cattle prices. Technical constraints remained where salinity and sodicity limited pasture recovery despite improved rainfall and ground cover.

Supportive materials

Videos:

From the Ground Up (YouTube)



Post-graduate university student supporting innovation on remote cattle stations (YouTube)



Assessing Mitchell Grasslands with the aid of drones and Artificial Intelligence (YouTube)

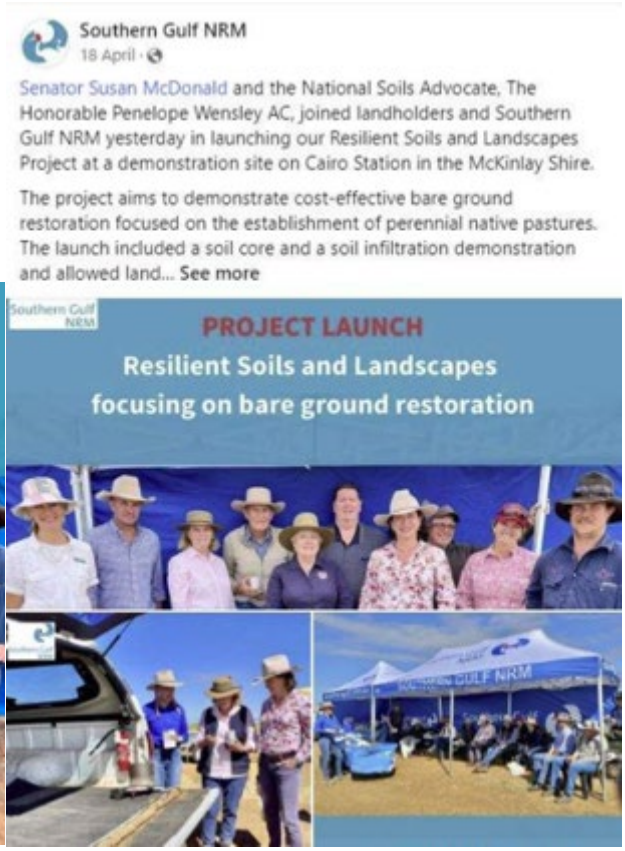


Webpages:

Resilient Soils and Landscapes Project - Southern Gulf NRM (Website Launch Notice)

Southern Gulf NRM | Mount Isa QLD | Facebook (Facebook)





Photos:



Soil core taken at a field day demonstration (Southern Gulf NRM)



Farmers and advisors attending a field day demonstrating the benefits of perennial grass groundcover (Southern Gulf NRM)



Demonstrating how to take a soil core using a motorized post driver (Southern Gulf NRM)

RAIZ
Resilient Agriculture Investment for net-Zero land degradation

RAIZ is a global effort to map and mobilize funding for the restoration of degraded farmlands worldwide. It is hosted by the Ministry of Agriculture and Livestock of Brazil (MAPA) under the FAO FAST Partnership with the collaboration of the UNCCD G20 Global Land Initiative and the Food and Land Use Coalition (FOLU).
For more information: FAST-Partnership@fao.org

Australian Government
Department of Agriculture, Fisheries and Forestry