



Implementing social-ecological resilience principles in the Australian government's future drought fund program: opportunities, challenges and lessons learned

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Abstract

Climate change impacts are increasing, leading to more frequent, longer and more severe droughts and other climatic events. The complexity of these issues requires proportional systems-based adaptation and transformation approaches to build resilience and achieve sustainability. The Australian and State and Territories governments commit to sustainability, adaptation and resilience to a changing climate in the National Statement on Climate Change and Agriculture. These commitments are reflected in multiple governmental initiatives and programs, one of which is the Department of Agriculture, Fisheries and Forestry's Future Drought Fund (FDF). The FDF offers a unique pathway to achieving sustainability through building drought and climate resilience, founded on robust scientific principles of social-ecological resilience. The FDF supports farmers and communities to learn about, be prepared for, and have the capacity and options to respond to drought and other climatic shocks, including through transformational change. The FDF programs fund projects, including in the rangelands, to achieve its objectives. This paper discusses how the FDF implements resilience principles and fosters collaboration and collective adaptive learning and action to achieve shared resilience and sustainability outcomes. Progress to date is presented and links to case studies of successful and impactful FDF-funded projects are provided. Lessons learned, opportunities and challenges facing FDF highlight the important role it can play in supporting resilient social-ecological systems in Australia.

Introduction

Drought is a recurring feature of Australia (DAFF 2024). Climate change is increasing the frequency, duration and severity of inter-connected climatic events, including drought (DAFF 2024; ABARES 2022; DAFF 2025b). The complexity of this issue requires proportional systems-based adaptation and transformation approaches to build resilience and achieve sustainability (IPCC 2023). The Australian and States and Territories governments commit to sustainability, adaptation and resilience to a changing climate in the National Statement on Climate Change and Agriculture (DAFF 2023a). It has several initiatives that aim to address sustainability and resilience to climate change, including the Climate Smart Sustainable Agriculture Package, National Soil Action Plan, Carbon Farming Outreach Program and the

Future Drought Fund (FDF) (DAFF 2025b). The FDF is aimed at achieving public good through building resilience to drought and broader climate impacts (DAFF 2025a). This work is uniquely underpinned by the systems-based social-ecological resilience theory (Folke 2016). Since its inception, the FDF has progressively improved the implementation of this theory, including through communicating and engaging with its stakeholders and supporting projects on the ground.

This paper provides an overview of the FDF and explores how it implements resilience principles. Quotes and examples from program guidelines and other key FDF documents are provided, as well as links to successful case studies. Lessons learned, opportunities and challenges are briefly discussed.

The Future Drought Fund: an overview

The FDF is a \$5 billion initiative that was set up in 2019 under the *FDF Act 2019* (DAFF 2025a). \$100 million is available each year to fund programs aimed at supporting farmers and regional communities to build social, economic and environmental resilience, through learning about, being prepared for, and having the capacity and options to respond to drought and other climatic shocks (DAFF 2025b). The FDF constitutes a unique and distinct pathway to sustainability, through a focus on building whole-of-system resilience to achieve sustainability. This approach includes innovative and, where needed, transformative management of natural capital that underpins landscape function and ecosystem goods and services, agricultural businesses and agriculture-dependent communities. Delivery of FDF programs is governed by 4-yearly Drought Resilience Funding Plans (FP) that set FDF objectives and aims (DAFF 2025a). Under the new 2024-28 FP and supporting Investment Strategy (IS) 10 programs will be delivered over the next 8 years. In addition, funding will be available for monitoring, evaluation and learning (MEL) activities and knowledge sharing, to share and facilitate learning from FDF outcomes (DAFF 2025b).

Social-Ecological resilience theory: FDF as an implementation pathway

Social-ecological resilience theory defines resilience as “*the capacity of a system to absorb disturbance and reorganise so as to retain essentially the same function, structure and feedbacks*”; in other words, “*the ability to cope with shocks and keep functioning in much the same kind of way*” (Walker and Salt 2012) – where a system is “*an interconnected set of elements that are coherently organized in a way that achieves something*” (Meadows 2008), and social-ecological system (SES) as a linked system of humans and nature (Folke 2016). The FDF adapted this definition in its FP by stating that “*a key aspect of drought resilience is the ability to adapt, reorganise or transform in response to changing temperature, increasing variability, and scarcity or changed seasonality of rainfall, for improved economic, environmental and social resilience*” (DAFF 2025a,b), and looking at landscapes as complex and adaptive SES and farmers and regional communities are actors in, or part of these systems (DAFF 2025b). The FDF supports both adaptation and transformation, taking into account the adaptability and transformability of a system as defined by Walker and Salt (2012).

The FDF enables building specified resilience of landscapes, farmers and communities to drought, focussing on activities that help ensuring that SES avoid crossing critical social, economic or ecological thresholds into undesirable regimes, sometimes irreversibly (Walker and Salt 2012) – which makes these SES untenable: “*Increased adoption of whole-of-system thinking approaches to manage landscapes, including knowledge of and capacity to define and act on critical tipping points or thresholds, and contributing to connectivity across broad landscapes*” (Resilient Landscapes Program). In addition, FDF

programs promote and support building general resilience to drought and broader climate impacts (DAFF 2025b), including the principles of complex adaptive systems thinking, safe-fail experimentation, broad participation, diversification, networks and connectedness, and adaptive learning (Carpenter et al. 2012; Biggs et al. 2015). Examples are provided below.

As outlined in the FP and IS, the FDF has 3 inter-connected strategic objectives of building social, economic and environmental resilience to drought, an approach that recognises the complexity of SES and maximises the impact of FDF investments (DAFF 2025b): *“In line with whole-of-system thinking, feedbacks and interactions between components of complex systems (in this case the land, people, industry, governance and so on.) lead to non-linear changes that are not necessarily the sum of the characteristics or dynamics of components, or any pair of interactions between these components. The whole system is therefore often more than the sum of its parts (Drought Resilience Soils and Landscapes Program).*

The FDF supports safe-fail experimentation with, and adoption of all forms of change, i.e. incremental, adaptive, transitional and, especially, transformational when the system becomes untenable (DAFF 2025b): *“The program allows for ‘safe-fails’, which will help participants learn from the experience, and assist primary producers and rural communities to adopt innovative, diverse, adaptive and/or transformative approaches to build drought resilience in agricultural landscapes” (NRM Drought Resilience).* The FDF also promotes diversification: *Increased diversification in land use and management, so that multiple options and pathways are available to farmers to prepare, respond, and recover from drought (Resilient Landscapes Program).*

The FDF values networks and connectedness, and the diversity they bring. It collaborates and partners with diverse stakeholders to design and deliver programs. It seeks opportunities to enact community-led, co-design, and / or end-user approaches, in collaboration with existing community networks, Indigenous organisations and communities, natural resource management organisations, businesses, industry and farmer groups (DAFF 2025b). Our delivery partners are similarly encouraged to form and maintain networks: *“Networks are established or strengthened between stakeholders who partner and share responsibility for managing natural resources (including public and private land managers), which improves connectedness and diversity of approaches across the landscape” (NRM Drought Resilience Program).* One program – Networks to Build Drought Resilience – is dedicated to that (DAFF 2025a). We support consortia of partners to deliver projects under other programs: *“[the program] fosters collaboration, in the form of consortia of partners and stakeholders collectively working on shared issues and outcomes to improve integration, coordination, communication, planning and implementation of drought resilience activities, and avoid unnecessary duplication” (Resilient Landscapes Program).* This approach enables learning as a tool to build resilience: *Collective adaptive learning and capacity building through stronger collaborative networks between farmers and other land managers, including First Nations land managers, in support of increased adoption of drought resilient practices, technologies or approaches (Resilient Landscapes Program).* To further support learning, successful case studies continue to be built and published (DAFF 2023a).

Opportunities and Challenges

Since its inception, the FDF has been communicating with its stakeholders and delivery partners how it’s aiming to support building resilience and the principles and theories underpinning its work. This includes

FP and IS, program guidelines, meetings and workshops, and general communication material. The FDF stresses that resilience is about embracing change, particularly transformational where needed, and that to be resilient does not mean ‘not to change’ (Walker and Salt 2012). This engagement has been an iterative process. We realised the need to sensibly and progressively utilize and promote the adoption of technical concepts, as our experience and that of our delivery partners matured. As programs were rolled over the last 5 years, the FDF re-focussed its messages.

One of the unique aspects of FDF is its proactive support for transformation, especially through safe-fail experimentation. Transformability of a system is underpinned by 3 determinants: preparedness to change, capacity to change and options for change (Walker and Salt 2012). The FDF supports all three, by helping in changing paradigms towards accepting the need for transformation where needed, and providing funding for experimentation with transformative practices and approaches that go beyond current best practice. One of the most important lessons we learned is that change, especially transformative, takes time, hence the new suite of longer and larger programs (DAFF 2025b).

As mentioned above, the FDF recognises and focusses on fostering networking and collective adaptive learning and action to achieve shared resilience and sustainability outcomes (DAFF 2025b). In addition to the approaches mentioned above, and as part of its new suite of programs, the FDF provides funding for a strong MEL strategy. Having a robust MEL system enables both learning and sharing knowledge. Evaluation of earlier FDF program, currently underway, will help us determine and share how and to what extent FDF is succeeding and contributing to the broader resilience and sustainability ecosystem. We also created a MEL Community of Practice (COP) where our staff, stakeholders and external experts exchange ideas and share insights and lessons learned. We equally participate in other government COPs and working groups, and have an ongoing collaborative engagement with industry and research. All this work allows FDF to contribute to breaking silos.

The FDF recognizes that dealing with complex systems is itself a complex task. Behaviors, beliefs, world views, values and knowledge that influence actions and attitudes of people need to be taken into account to build trust and openness and achieve change (Dyball and Newell 2015). Policies that do that probably work best, and this has been our experience. Giving our delivery partners ownership of program design and outcomes is proving to be empowering and motivating. This is helping FDF to facilitate changing behaviors and promoting adoption of resilience practices, approaches and systems at scale. Delivery of various programs by consortia of partners further enables that, by aiming to collectively achieve change beyond projects’ life and scope (DAFF 2025a).

Conclusion

There is a current momentum to build resilience to drought and broader climate risks. FDF is a key player in that, given the nature of its activities, robust theoretical foundations, and the perpetuity of its funding. Implementing its various approaches puts the FDF in a unique position to contribute to policy, on one hand, and academic deliberations of social-ecological resilience theory on the other. The more the FDF evolves and learns, the better it will get at that. This is a remarkable opportunity that needs to be leveraged and supported, and it is. FDF is effectively an enabler of systemic and transformational change, through continued experimentation, learning and sharing knowledge with its networks of stakeholders and partners. As Walker (2020) states, transformational change “*is and will always be an ongoing process of exploring, learning and keeping options open*”.

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References

- Ackoff R.L. (1986). 'Management in small doses', (Wiley, New York)
- Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) (2022) Climate and Drought. Available at <https://www.agriculture.gov.au/abares/research-topics/climate> [Accessed 27 01 2025]
- Biggs R, Schlüter M and Schoon ML (2015). 'Principles for building resilience: Sustaining ecosystem services in social-ecological systems', (Cambridge University Press, UK)
- Carpenter SR, Arrow KJ, Barrett S, Biggs R, Brock WA, Crépin AS, Engström G, Folke C, Hughes TP, Kautsky N, Li CZ, McCarney G, Meng K, Mäler KG, Polasky S, Scheffer M, Shogren J, Sterner T, Vincent JR, Walker B, Xepapadeas A, and Zeeuw A de (2012). General resilience to cope with extreme events. *Sustainability* 4, 3248–3259.
- Department of Agriculture, Fisheries and Forestry (DAFF) (2023a) Future Drought Fund - Case Studies. Available at <https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/case-studies> [Accessed 27 01 2025]
- Department of Agriculture, Fisheries and Forestry (2023b) National Statement on Climate Change and Agriculture. Department of Agriculture, Fisheries and Forestry, Canberra, ACT.
- Department of Agriculture, Fisheries and Forestry (DAFF) (2024) National Drought Agreement 2024-2029. Available at <https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/drought-policy/national-drought-agreement> [Accessed 27 01 25]
- Department of Agriculture, Fisheries and Forestry (DAFF) (2025a) Future Drought Fund. Available at <https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund> [Accessed 27 01 2025]
- Department of Agriculture, Fisheries and Forestry (DAFF) (2025b) Future Drought Fund Investment Strategy. Department of Agriculture, Fisheries and Forestry, Canberra ACT.
- Dyball R and Newell B (2015). 'Understanding Human Ecology', (Routledge, New York)
- Folke C (2016). Resilience (Republished). *Ecology and Society* 21(4), 44-73.
- Intergovernmental Panel on Climate Change (2023). IPCC, 2023: Climate Change 2023: Synthesis Report, Summary for Policymakers. In 'Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II, and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change'. (Eds H Lee, J Romero) pp. 1–34.
- Meadows D (2008). 'Thinking in systems', (Earthscan, London)
- Walker B (2020). Guiding rangelands into an uncertain future. *Rangeland Journal* 42, 235–237.
- Walker B and Salt D (2012). 'Resilience Practice', (Island Press, Washington DC)