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**DISCUSSION PAPER:**

**Drought Resilience Research and Adoption Investment Plan**

May 2021



**Australian Government**  
**Department of Agriculture,**  
**Water and the Environment**



**Future  
Drought  
Fund**

This program received funding from the Australian Government's Future Drought Fund.

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# 1 Context

## 1.1 The Future Drought Fund

The \$5 billion Future Drought Fund (FDF) supports initiatives to improve the drought resilience of Australian farms and regional and rural communities. Only projects and activities that enhance the public good (that is benefits that are not solely for individual farm entities) are funded.

The Fund has three inter-connected strategic priorities:

- economic resilience for an innovative and profitable agricultural sector
- environmental resilience for sustainable and improved functioning of farming landscapes
- social resilience for resourceful and adaptable communities.



A key component of the FDF is a Research and Adoption Program to fund research, development, extension, adoption, and commercialisation (RDEA&C) activities that build drought resilience. The program will receive an allocation of \$117.3 million (to 2023-24) to fund four interconnected elements:

- Adoption and Innovation Hubs
- Innovation Grants
- A Science to Practice Forum
- A Research and Adoption Investment Plan

For more information about the Future Drought Fund, visit the website: [agriculture.gov.au/ag-farm-food/drought/future-drought-fund](https://agriculture.gov.au/ag-farm-food/drought/future-drought-fund)

## 1.2 The Research and Adoption Investment Plan

Alluvium together with the Australian Farming Institute have been engaged by the Department of Agriculture, Water and the Environment (DAWE) to develop a Drought Resilience Research and Adoption Investment Plan that sets out the investment priorities of the Drought Resilience Research and Adoption Program of the Future Drought Fund (FDF).

The Investment Plan will incorporate input from farmers and regional and rural communities to ensure that programs are designed and delivered through a user-based lens and, where possible, a community-led, co-design, and/or end-user approach. The plan will outline short and long-term drought resilience research and adoption investment priorities for the FDF. It will help define the questions that agricultural enterprises and communities need answered by science, and potential mechanisms for translating research outcomes into drought resilient practices. The plan will help target investment towards projects that align with those already underway, reducing investment overlap. It will support researchers, investors and policymakers who need up-to-date information on the needs of agricultural communities to make effective drought RDEA&C investments.

In the coming weeks, we will be engaging — via workshops and a survey — with the people who should benefit the most from drought resilience RDEA&C — such as farmers, communities and associated agricultural businesses — to identify their needs and priorities. This discussion paper is provided to give some context to the workshops and survey, to consider the things that make people, industries, and communities resilient to drought, to present some of investment priorities for the FDF that have already been identified, and introduce the concepts of economic, social and environmental resilience.

For more information about the development of the Research & Adoption Investment Plan, visit the project website: [consultnce.engagementhub.com.au/droughtresilience](http://consultnce.engagementhub.com.au/droughtresilience)

## 2 Drought in Australia

Drought is an enduring feature of the Australian landscape. It has significant economic, social and environmental impacts. Drought impacts the productivity and profitability of farms. It affects businesses, communities and regions. Drought also has significant social and environmental impacts.

Because of climate change, drought is likely to be more regular, longer in duration, and broader in area. It means that farmers and communities who rarely see drought are likely to see it more often. And those that have been managing drought for many years may now see it intensify beyond their lived experience. Ultimately, the nation could see some areas of Australia become more marginal and unproductive.<sup>1</sup>

## 3 What is drought resilience and how can it be strengthened?

Drought resilience is a complex concept with multiple aspects that operate at different scales. It can be a characteristic of an individual agricultural business, the agroecosystem of a farm or region, or an agricultural community. Resilience is the capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance. It helps these systems to respond and reorganise in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it maintains capacity for adaptation, learning and/or transformation.

The Drought Resilience Funding Plan defines drought resilience as

“the ability to adapt, reorganise or transform in response to changing temperature, increasing variability and scarcity of rainfall and changed seasonality of rainfall, for improved economic, environmental and social wellbeing.”<sup>2</sup>

We have broken-down the definition of drought resilience into five principles that have been derived from the Stockholm Resilience Centre, The City Resilience Index and the Resilience Alliance. We can use these principles to take drought resilience from an abstract concept and describe the practical steps we can take to build it.



<sup>1</sup> CSIRO and Bureau of Meteorology 2018, State of the Climate 2018, Bureau of Meteorology, Canberra, accessed 28 March 2019, <<http://www.bom.gov.au/state-of-the-climate/State-of-the-Climite-2018.pdf>>.

<sup>2</sup> Australian Government (2020) *Drought Resilience Funding Plan 2020 to 2024*

### **3.1 Principle 1 – Planning and preparation**

The capacity of a community or individual to resist the pressures of drought is the first line of defence. Communities that are prepared and have a plan are better able to withstand threats without changing the social, economic and environmental services they provide.

### **3.2 Principle 2 – Effective leadership and governance**

Communities that have effective leadership and governance enhance their resilience to threats. Governance frameworks should be inclusive, encouraging broad engagement of all sectors across the community, especially the least resistant and vulnerable groups. This includes integrated decision-making within and between key industries during a crisis and encourages a free exchange of resources and information so the community can function collectively and respond to threats consistently.

### **3.3 Principle 3 – Diversity and redundancy**

Redundancy refers to the spare capacity that is purposely created to prevent threats or crises spreading or jeopardising the entire operation. Redundancy is often achieved through a diversity of ways in delivering services to maintain the function and availability of those services during a crisis. Redundancies should be deliberately planned so that services are well distributed and therefore not impacted similarly by threats throughout a community.

### **3.4 Principle 4 – Flexibility and adaptability**

A flexible community is one that can modify its behaviour and adopt alternative strategies in response to changing conditions or sudden threats. Flexible systems encourage multiple sources of knowledge (e.g. science, Traditional Owners, industries etc). A flexible approach also enables the community to use past experience to inform future decisions in order to better respond (or adapt) to threats rather than desiring a return to how things were before the threat. Adaptability allows for a community to continue to function and deliver essential social, economic and environmental services.

### **3.5 Principle 5 – Ability to recover**

Recovery refers to a community's capacity to bounce back from threats or crisis and rapidly restore services and functions. A rapid recovery requires communities that can quickly adopt different methods to deliver critical services. Recovery also requires communities to be resourceful, allowing for unpredictability in planning and governance.

## 4 Developing funding priorities for the FDF

Initial consultation with stakeholders has identified several priorities for investment in research and adoption activities:

1. **Leveraging the existing innovation system** by working with existing research providers and investors (such as Rural Research and Development Corporations – RDCs) delivering research that is related to drought resilience but does not focus on it exclusively.
2. **Developing a roadmap for farming systems** by identifying potential future practices and enterprises that are more drought resilient or better adapted to a drier long-term climate.
3. **Getting more from information products and platforms** and presenting information in ways that help agricultural producers to better plan and prepare for drought.
4. **Addressing the social and environmental drought resilience gap** by funding research that identifies environmental factors that improve drought resilience (e.g. improving soil condition, pest control).
5. **Improving risk management** by equipping agricultural producers with better knowledge and tools to support better and earlier decision-making.
6. **Participatory action research to further connect users** and research providers and develop peer-to-peer learning networks within agricultural communities.

The FDF is already funding activity in some of these areas, for example supporting the establishment and operation of the Adoption and Innovation Hubs to drive participatory research and connection to research users.

## 5 What are research user's priorities?

The FDF is committed to improving the public good by adopting a triple-bottom-line approach to building drought resilience. Therefore, we are seeking feedback from research users regarding their priorities in these areas. When reading the following section, we want research users to think about their priorities for investment in research and adoption activities in each of the areas.

### 5.1 Economic resilience

Economic resilience looks different to each individual farmer or industry. For example, a grazier and a cropper will prepare for and act to manage/mitigate drought conditions differently. They will also experience different impacts on their cash flows, with the grazier experiencing significant expenses in relation to feeding and varying income from destocking, while a cropping farmer will produce little income but also incur lower levels of variable operating costs.

Sometimes even the most financially resilient farmers need government assistance and intervention to cope with fluctuating farm incomes from natural disasters including ongoing drought conditions. However, government drought programs are usually aimed at addressing short-term impacts, rather than focussing on long-term strategies to improve drought *resilience* on farms.

### 5.2 Environmental resilience

The ecosystem services upon which agricultural communities rely are significantly impacted during drought. This threatens productivity which can have cascading impacts throughout the economic and social components of the community. By enhancing these services through best practice farm and landscape management we can enhance the overall resilience of the community. Essential ecosystem services include:

- Soil carbon content that maintains the productivity of soil and mitigates climate change
- Soil health that maintains the quality and quantity of water resources

- Healthy, biodiverse ecosystems that suppress weeds and pests
- Ground cover that controls soil erosion

Each of these ecosystem services interact to enable agricultural communities to function and thrive. The resilience of these services to drought is related to its sensitivity and degree of exposure to the impacts of drought. To understand the resilience of an agricultural community to drought we need to better understand the state of these ecosystem services.

### 5.3 Social resilience

The prosperity of regional communities and agriculture are closely intertwined. When one flourishes, the other usually follows suit. Unfortunately, the converse also occurs. During drought, economic activity within rural communities decreases, usually resulting in a decline in social capital as people move in search of employment opportunities and the remaining being impacted by a decline in services availability. There are also mental and physical health impacts of drought<sup>3</sup>, which put additional strain on family and community services.

Social resilience can be thought of as the ability to cope, adapt, and transform in response to difficulty. However, resilience is not simply the act of responding but rather the awareness, perceptions, skills, abilities, and context that comes before responding. An individual may not have the capacity to respond if they do not have enough knowledge of the problem, may not believe that adapting will benefit them, or may not have the tools necessary to adapt<sup>4</sup>. Social, institutional, and physical context is also important, as individuals may not have the social or financial support to actively respond and adapt<sup>4</sup>.

## 6 Developing the Investment Plan and next steps

In late April / early May, the project team engaged with research providers and users in four collaborative workshops that identified priorities for research and adoption in northern, eastern, southeastern, and southern Australia. The team will also be engaging directly with research users via industry networks in the coming weeks. A survey will be open for all interested stakeholders to provide input to the Investment Plan up until 11 June. The survey can be completed quickly within less than ten minutes but also allows for detailed responses and submissions. We encourage all interested stakeholders, and especially research users who work on the ground in regional communities to complete the survey.

The project team will be presenting their initial findings of what research users need to research providers at a workshop on 2 June. The purpose of this workshop is to guide investment in research programs that are focused on user's needs, are relevant to the drought issues they face, and produce findings that can be acted upon.

Together, these activities will help to develop the draft Research and Adoption Investment Plan and present it at the Science to Practice forum in late June. It is likely that the Innovation Hubs and Forum attendees will have further input to the plan at that stage and that the plan will be updated to incorporate further feedback over the next 12 months.

<sup>3</sup> Steffen, W., Vertessy, R., Dean, A., Hughes, L., Bambrick, H., Gergis, J., & Rice, M. (2018). *Deluge and Drought: Australia's Water Security in a Changing Climate*. Climate Council of Australia.

<sup>4</sup> Keath, N. (2012). Resilient South Project - Background Paper: Transitioning Towards Resilient Futures - Building Capacity and commitment to adapt to climate change in the southern Adelaide region.