



Australia's National
Science Agency

CSIRO Submission 19/696

Federal Government's response to the drought, and the adequacy and appropriateness of policies and measures to support farmers, regional communities and the Australian economy

Senate Standing Reference Committee
on Rural Affairs and Transport

February 2020

Introduction

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency and one of the largest and most diverse research agencies in the world. Its purpose is to solve the greatest challenges through innovative science and technology. Its scientific research assists Australian industry and the Australian community and contributes to national and international objectives and responsibilities of Government. It carries out a diverse portfolio of research, including in areas such as energy, climate, water, biodiversity, oceans, information technology, digital innovation, health, mining, manufacturing, food, agriculture, biosecurity and natural resources.

As the national science agency, CSIRO provides independent advice based on its research. While CSIRO has no specific comments against the terms of reference, it provides the following information on research it is carrying out relevant to drought that may assist the Committee in its deliberations. Should it help the Committee with the inquiry, CSIRO would welcome the opportunity to discuss the research it is doing to support this important sector of our economy.

CSIRO drought research

CSIRO is tackling drought as a priority area to improve the drought resilience of our land, waterways, people and infrastructure. As noted in the Australian Government Drought Response, Resilience and Preparedness Plan, our changing climate is projected to increase the frequency and severity of extreme events, including droughts.

With world-class and multi-disciplinary researchers and facilities, we are working to solve these challenges. CSIRO has a range of technologies and capabilities that can improve drought resilience and assist with drought response, from improved forecasting to on-farm risk mitigation, and improved food quality to water resource management.

By integrating systems science and technology to address drought resilient agriculture, CSIRO is partnering across the innovation system to create information, tools and options to accelerate farm and community adaptation, foster new high value-adding agri-food industries, protect land and water resources and anticipate and manage biosecurity threats.

Our work can be categorised in the following sections.

Forecasting and monitoring at unprecedented levels of accuracy and resolution.

- We're improving multi-year climate forecasting to provide policy-makers, industry and individuals with better information to manage risk and make long-term decisions.
- The National Drought Map compiles data from Australian government bodies to provide a single-view platform of drought information across the country. This is accessible through the NFF Farm Hub.
- The Australian Community Climate and Earth System Simulator (ACCESS) is among the world's best climate models and has been developed with BOM specifically for Australia.
- Weather Together allows farmers to access localised weather forecasts from BOM and learns from on-farm weather stations to develop personalised forecasts.

Environmental resilience through improving access for policy makers and land managers to timely information.

- Our environmental water assessments better inform decision makers on the sustainable use of our valuable water resources. Examples include: the Murray-Darling Basin, Pilbara and Tasmania assessments
- We've developed tools to undertake comprehensive basin scale assessments of water capture and storage options to support irrigated agriculture.
- The GEOGLAM Rangeland and Pasture Productivity Map is improving land management outcomes, helping to manage groundcover and reduce erosion and dust in Australia and abroad.
- We have developed tools and models of how forests grow and function, and their response to climatic risks so they can be managed sustainably into the future.

Farm resilience to make Australian paddocks and pastures more resilient in times of drought.

- Improved farming systems practices, such as dual-purpose crops and early sowing, are allowing farmers to maximise use of their on-farm resources and boost returns.
- Our cotton production is the most water efficient in the world, and we're working on improving varieties and irrigation technologies to make every drop count.
- New forages are helping producers better manage the welfare of their stock during feed gaps, while also improving animal productivity.
- We're developing genomics and machine-learning to more quickly develop new crop varieties that are better adapted to Australian conditions.

Smart agriculture using innovative technologies that improve farm profitability and productivity.

- Yield Prophet® helps farmers with management decisions by providing real-time information on soils and crop growth.
- The Graincast™ digital platform is helping Australian growers, bulk handlers and marketers make decisions by providing widescale grain sector predictions.
- Together with BOM and FarmLink we developed weather and climate guides for all Natural Resource Management regions, improving on-ground decision making.
- Our WaterWise sensor technology monitors the level of water stress a crop is under, and can predict its future water needs, aiding decision making.

Social and urban resilience to strengthen the capabilities and responses of communities to droughts.

- We're investigating how to 'water bank' treated wastewater by storing it in depleted groundwater aquifers, for later use in urban water systems.
- The 2019 Australian National Outlook projects outcomes until 2060 across land and energy use, industry and urban design for a resilient and prosperous future.

- Our on-farm fire research is helping protect farmers and communities at their most vulnerable during drought by protecting their assets with new land practices.
- We're studying ways to secure more reliable freshwater supplies using methods such as rainwater harvesting, as well as changing water conservation behaviours to reduce demand.

As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Unlocking a better future for everyone.

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