LA TROBE UNIVERSITY

Productivity Commission

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Future Drought Fund

ENQUIRIES
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A. INTRODUCTION

La Trobe welcomes this review of the effectiveness of the Future Drought Fund (FDF) and its programs in supporting farmers and communities prepare for drought.

While we broadly endorse the Future Drought Fund's objectives and vision, we call for significant widening of the scope of the Fund to include climate resilience and to encompass all types of climate events beyond drought such as floods or cyclones. Moreover, to date, the FDF has been overly-focused on sustainable agriculture as a means of underpinning economically-resilient communities. We submit that environmental impacts as well as long-term food security and nutritional quality are all mutually-dependent elements that need to be addressed to achieve sustainable agriculture and sustainable regional development/communities.

We take this opportunity to outline the way La Trobe researchers are finding solutions to address these challenges including through making food production more efficient and resilient, providing balanced nutrition, increasing the climate resilience of crops and supporting regional communities.

We also outline the aims of the Australian Food Innovation Centre – our exciting partnership with CSIRO at our Bundoora campus which will support research innovation, (re-)skilling of the agri-food sector future workforce, commercialisation and manufacturing in the agri-food sector by providing state-of-the-art research facilities and expertise, as well as opportunities for co-location, industry collaboration and start-up incubator spaces.

Our responses to the review's Discussion Questions are included in Section B. La Trobe looks forward to working with the Productivity Commission. Further information about any of the points raised in the submission can be provided upon request.

B. LA TROBE RESPONSE TO INQUIRY'S DISCUSSION QUESTIONS

1. **Are the funding principles, vision, aim, strategic priorities, and objectives of the Funding Plan (attachment B) appropriate and effective?**

- While La Trobe broadly supports the core elements of the Funding Plan, we believe that the program would be more effective with a more holistic-systems based approach to the value and impacts of our food production systems. Plan B mentions innovative proposals but fails to address the development of innovation ecosystems to support preparedness, response and recovery from drought and other disasters.

- To date, there has been an emphasis on economic and agricultural production resilience to the almost near exclusion of projects focusing on social (regional), environmental or ecological resilience. While, for instance, sustainable agriculture is important in its own right and as means to ensure communities are more economically resilient, it does not exist in a vacuum. Workforce in regional areas is essential and requires functional communities to support it. Without addressing the entire agricultural ecosystem of services, end users and stakeholders, significant risk will remain in the system. Climate resilience, ecosystem services, environmental impacts (including on catchment health, climate and biodiversity) as well as long-term food security and nutritional quality are all mutually-dependent elements of what leads to sustainable agriculture. Unless all of these elements are addressed, the overall aims may not be achieved.

- La Trobe is therefore of the view that the entire scope of the Funding Plan is too narrowly limited by the political context of when the Fund was originally established. La Trobe

recommends a re-think of the Fund's purpose to focus on 'Climate Resilient regional communities' with the Fund being broadened to encompass all types of climate events including events such as floods or cyclones which are more becoming more intense and more frequent as we just recently witnessed in Australia with the extreme flooding and bushfires of 2022. The scope of the Fund should also be broadened to encourage outcomes that underpin resilience and mitigate risk, encouraging systems-based solutions that integrate social, environmental, agricultural and economic disciplines. Drought preparation, prediction and recovery are as essential as the response during periods of drought. However, de-risking requires a broader understanding of the climate exposure of food and fibre production and, as such, future funding should be directed towards a broad-based Plan, Prepare, Respond Recover (PPRR) platform that reduces climate risk and is event agnostic.

- Further clarity is required on what is meant by the term 'resilience' – does this only refer to the capacity of systems (ecological, agricultural, social) to recover after drought or is it to function effectively for longer into and during drought periods? In addition, does resilience encompass the preparedness of systems to respond to droughts and/or other disasters?

- La Trobe recommends that a portion of the Fund should be quarantined to conduct research and address issues that are likely to emerge in the future (e.g. post-2050) rather than focusing on present issues and challenges.

2. Do the programs, arrangements and grants focus on the right priorities to support drought resilience? If not, what should the programs, arrangements and grants focus on and why?

- The focus on drought is too narrow to support a thriving agribusiness sector and supporting ecosystem that can capitalise on the opportunities presented by the food and fibre needs of a burgeoning global population as well as by the medicinal agriculture sector. The focus should be broadened to ensure that R&D continues to drive new knowledge and innovation, rather than simply relying on the presumption that issues can be resolved through adoption of existing knowledge, which is a flawed assumption of the current 'Adoption-focused' approach.

- To manage agricultural landscapes sustainably and equitably in the long-term, we need to quantify the reliance upon, and impact of, agriculture on the environment (i.e., natural capital) – e.g., soil, water, native vegetation and natural ecosystems – and climate.

- For understandable reasons, the Fund has been focused on immediately - achievable/implementable actions. While these actions are needed, it has meant little time and effort has been dedicated to evaluating past actions or leveraging existing long-term data sets to gain new insights into outcomes that have long time lags (e.g. soil carbon, biodiversity). It appears that the majority of programs refer to completely new programs or innovations. We believe that through flexibility in current program architecture, there might be scope for improved outcomes.

- Better co-ordination with the entire sector (i.e. from "paddock to plate"), including Regional Development Corporations would lead to better outcomes overall. It would be beneficial to take a more holistic approach to embracing the potential challenges that may arise whether it is at the level of the farmers, local communities and/or community health (both from a nutritional perspective and mental health).

- As further outlined under Point 4, the use of indigenous organisation and knowledges should be more prominent. Aboriginal and Torres Strait Islander people are the first farmers and have been adapting to drought and disaster for millennia.

3. Should the scope of the Fund be broadened to support resilience to climate change? Why or why not?

- As outlined in the response to Point 1, **La Trobe strongly believes that the scope of the Fund should be broadened to include 'environmental & social/regional resilience'**. The current focus on 'Drought' constrains consideration of the broader climate exposure risk of the sector, risks mal-adaptation (inefficient, misplaced adaption efforts) and encourages duplication of effort, resources and programs. We also believe that the pool of funding should be increased due to the recognised importance of ecosystem services to agricultural production.

- There is no doubt that extreme weather events (such as floods, storms, cyclones, droughts and heat waves) are of consequence and become more frequent and severe due to climate change. The impacts of climate change should be explicitly recognised both directly and indirectly.

- We believe that one element of increasing resilience to climate change is through producing **"climate resilient" crops** which are for instance drought and/or salt tolerant, more water-efficient and less dependent on fertiliser inputs. As more countries around the world transition from 'developing' to 'developed' countries, more food will be required and the focus will have to be not just on increasing the quantity of food available but also on improving its quality. It may also be that alternatives will need to be found for fuels and for fertilisers as well as for new varieties of crops that require less water and which utilise nitrogen from symbionts. For example, examining whether cereals can be made more like legumes, which access their nitrogen from rhizobia (nitrogen- fixing bacteria). In order to make these step changes and to reimagine the entire food supply chain, a significant investment in the development of agricultural and food technologies will be required - such innovations can then be reworked into the food supply chain. Section C outlines the extensive work by La Trobe researchers in the agri-food sector to make food production more efficient both in terms of maximising crop yields and protecting crops from disease.

- Protected cropping and systems to reduce water usage, new methods of biological control, automation and nutrient recycling is growing rapidly but needs to be supported by rigorous innovation and evaluation.

4. How could the Fund enhance engagement with and benefits for Aboriginal and Torres Strait Islander people?

- Recognition of Aboriginal and Torres Strait Islander people as Australia's first farmers with enormous knowledge of the Australian context.

- A broader focus on climate impacts will encourage a more holistic understanding of dynamic climate influences enabling more material interactions with Aboriginal and Torres Strait Islander people and enabling great engagement and valuing of the long climate history that comes with 50,000+ years culture.

- La Trobe researchers have been working in close consultation with Aboriginal and Torres Strait Islander communities in issues relating to water management. We recommend open dialogue and consultation with Aboriginal and Torres Strait Islander communities. Such a step would require different modes of engagement and consultation with different sectors than the current range of crops and activities allow for- for example, evaluating the potential of native grasses as crops.

- Overall, there is a need for greater recognition of the role that traditional knowledge and caring for country practices could have for climate adaptation. Adoption of a range of traditional practices at scale could have beneficial outcomes for whole of catchment condition – e.g. creating 'spongier' landscapes that better absorb and retain rainfall (leading to drought resilience).

5. What opportunities are there to enhance collaboration in planning and delivering drought resilience initiatives, including with state and territory governments?

- The current geographically- based structure involving Drought Innovation Hubs which are delivering on the FDF has been working as a good model for engaging all levels of government in the delivery of the program. While input from the local Hubs, informed by their local understanding, is crucial, there is also a need for more visible and effective leadership on climate resilience.

- As with many other initiatives such as for instance the National Collaborative Research Infrastructure Strategy (NCRIS) , there is scope for better coordination between state and federal initiatives.

6. Are there any other changes needed to improve the effectiveness of Part 3 of the Act? Who needs to do what to make those changes happen?

The fund needs to consider why we have a food and fibre sector, who is involved in the supply chains that underpin the sector and the relative sustainability of those supply chains. If these systems fail, the economic consequences are more significant than the 3% of GDP currently associated with the sector. A failure to underpin the sustainability of the food and fibre production and supply chains impacts food, health (particularly mental & nutritional health), employment, regional development, biodiversity conservation and carbon balance. Sustainable food and fibre need to be identified as a focus at Commonwealth level, given the public good benefit to the entire nation.

- Empowering farmers to transition to more sustainable (and resilient) ways of farming will require a farming systems approach that integrates social science (what motivates people and behaviour change), economics, ecology, agronomy, agricultural science and innovations in ag-tech and big data to improve data capture and usability. There is also a need to move the "reward" system (payments) to farmers away from a yield-based valuation to a quality based valuation system that embraces the environmental/social/health consequences of production. This is all part of the FDF remit and vision but needs further work to bring to fruition. Building on the work of the Australian Agricultural Sustainability Framework, whole-of-government support is needed to drive market initiatives and demand for sustainability reporting and transparency. Further, public education campaigns are required in order for

the public and purchasers of agricultural products to understand the reasons behind the cost of producing more sustainable (and resilient) crops.

- As outlined under Point 3, there needs to be a broader recognition of the importance of food security as a sovereign security risk. There is a need for vertical integration of the agriculture sector with the food manufacturing and health sectors to ensure crop resilience also embraces quality (not just yield) and minimises waste (circular economy). This includes ways of creating value from food waste such as using food and mixed organic waste to create energy, composts, fertilisers and higher value insect protein.

C. LA TROBE RESEARCH AND INDUSTRY PARTNERSHIPS IN SUSTAINABLE FOOD AND AGRICULTURE AND "CLIMATE-RESILIENT" CROPS

La Trobe has long-standing expertise in the agri-food space, helped by our network of regional campuses across Victoria and our world-class AgriBio facility, located at our Melbourne Bundoora campus. The 10-yr old AgriBio Building houses world-leading research facilities and personnel made possible through our partnership with the Victorian State Government (AgVic).

Researchers at AgriBio are developing novel approaches to key issues like increasing farm and livestock productivity, developing drought tolerant crops, sustainable and nutritious grains and food products, and protecting crops and animals from pests and disease as well as workforce development.

Located within AgriBio is the La Trobe Institute for Sustainable Agriculture and Food, with multimillion dollar investments by the University over the next five years to deliver solutions for sustainable and nutritious food production. These are some of the ongoing research projects:

- **Generating "fit for purpose grains"**

Generating "fit for purpose grains" means manipulating plant biology to engineer seeds and plants that are hardier and more nutritious than common varieties, while delivering on yield and processing attributes. In 2022, La Trobe researchers, led by Professor Mat Lewsey and Associate Professor Monika Doblin, completed a new oat transcriptome, revealing 2,000 previously unmapped genes in the oat genome. This will have wide ranging impact in breeding new and resilient oat varieties, which are fibre-rich, nutrient dense and less susceptible to disease.

Australia's oat industry is worth $400 million per year to the national economy and feeds thousands of people in Australia and overseas every day. By breeding better varietals of key crops which require less inputs in terms of fertilisers, water and pest control we are also safeguarding against future resource shortages and climatic variation.

Our researchers are also investigating way to improve key legume varieties which will form an important raw ingredient in plant-based foods in the future. In the past the emphasis has been on quantity, but in a world with increased pressure on resources, crops need to deliver quality as well, especially given the depleted state of Australian soils.

- **Protected cropping/Green-house horticulture**

La Trobe Professor Tony Bacic, co-lead of La Trobe's sustainable agriculture research theme, and a team of highly talented staff and post-graduate students are pioneering projects in the field of protected cropping – or greenhouse horticulture. This approach enables farmers to optimise harvest times, reduce nutrient and watering regimes and respond quickly to pathogens, viruses and insects. The result is a healthier, more sustainable, and productive crop. The protected cropping industry is the

fastest growing food producing sector in Australia, with a 'farm-gate' value of $1.3 billion and currently employs more than 10,000 people.

We believe there is significant opportunity for protected cropping across Australia and particularly in the Victorian food bowl incorporating Shepparton, Bendigo, Mildura and Swan Hill. La Trobe is uniquely placed to help deliver these innovations with its regional campuses primarily placed within the Victorian food bowl. From a government perspective, this will have the additional advantage of stimulating regional economies and developing a regional skilled workforce.

D. THE AUSTRALIAN FOOD INNOVATION CENTRE (AFIC): A LA TROBE-CSIRO PARTNERSHIP – SUSTAINABLE AGRICULTURE

La Trobe is strengthening its research expertise and infrastructure in the agri-food sector by forming a partnership with the CSIRO to create the Australian Food Innovation Centre (AFIC).

As part of our Research and Innovation Precinct, AFIC will be a core component of La Trobe's University City of the Future, a $5 billion transformation project at our Bundoora campus in Melbourne's north.

AFIC will combine the knowledge and experience of the University and CSIRO to support research innovation, commercialisation, manufacturing and organization by providing state-of-the-art research facilities and expertise, as well as opportunities for co-location, industry collaboration and start-up incubator spaces.

It will support industry partners to develop, test, scale and commercialise new food and beverage products to access emerging markets and build on Australia's position as a food innovator of the future.

AFIC will focus on six interconnected domain areas across the agri-food value chain namely **sustainable agriculture**, manufacturing for the future of food, food for health, sustainable and trusted, agri-digital ecosystem and the circular economy of food. AFIC will enable large and small companies, agriculture producers, food start-ups and inventors from anywhere in Australia to rapidly access the R&D required to move from concept to new food products or services, as well as cutting edge facilities like PC2 and wet labs, digital technology spaces and pilot scale development.

Importantly, it will provide an end-to-end service for food innovation right across the supply chain as well as an ecosystem which encourages and supports new ideas, innovation, collaborations, and start-ups. It will also provide training and development opportunities to address the skills gap and create a pipeline of highly qualified technicians, scientists, and entrepreneurs to support this growing sector.

Business planning for AFIC is complete, supported by a $1.5M Victorian Government Budget commitment last year. We would be delighted to brief the Commission on AFIC, its current status and the ways in which we are building support among industry and governments.