ARDC Translational Research Data Challenges Program: Food Security Data Challenges

Driving innovative and high-impact digital infrastructure for real-world problems

February 2022

Background

The Australian Research Data Commons (ARDC) is an Australian Government National Collaborative Research Infrastructure Strategy (NCRIS) facility, providing Australian researchers with competitive advantage through data. The Translational Research Data Challenges program is a national-scale 'flagship' initiative providing innovative and high-impact digital infrastructure solutions to real-world problems. The program focuses on translational research, operating at the intersection of research and broader society, to provide tangible and enduring economic, environmental and social benefits to Australia.

Collaborating with partners from governments, research institutions and industry, the Translational Research Data Challenges initiative will develop projects that address societal problems by removing barriers to the access, analysis and curation of data. Projects will be problem based, national scale, collaborative, unique, enduring and integrative across technological, cultural and organisational silos.

The Translational Research Data Challenges approach starts with a pressing societal problem, such as disaster resilience, crop yields or obesity. Through stakeholder consultations, key data challenges will be identified — such as data scale, sensitivity, availability and usability — that currently impede the advancement of solutions to these societal problems. Projects will focus on the development of digital infrastructure solutions, drawing on capabilities such as quality data collections and analytic platforms, underpinning compute and storage, informatics and data science expertise, as well as relevant governance and policy frameworks.

START
WITH A SOCIETAL
PROBLEM

IDENTIFY
THE DATA
CHALLENGE

BUILD
AND APPLY DIGITAL
INFRASTRUCTURE

Food Security Data Challenges

To enhance research into food production, supply, consumption and waste, the ARDC launched its Food Security Data Challenges. This Data Challenge will establish digital infrastructure that can be used in combination with artificial intelligence, robotics, blockchain and advanced data analytics.

Long-term strategies are needed to ensure Australia has a resilient and sustainable food industry that maintains its reputation in delivering high quality food nationally and internationally. The food industry is a strong contributor to the Australian economy. The agriculture industry – farming, fishing and forestry sectors – is forecast to be valued at $71.2 billion in 2020–21. The agriculture industry has set the goal to reach $100 billion in production by 2030 (Ag2030). To achieve this challenging goal by 2030, the agriculture sector and the broader Australian economy need to address some challenges and put in place a long-term strategy to diversify export destinations, improve supply chains and build domestic value-adding capabilities. [Delivering Ag2030, Department of Agriculture, Water and Environment[1]]

Food Security Data Challenges encompasses agriculture, genomics, health, manufacturing, nutrition, supply chain, transport, urban and regional infrastructure and waste. Initial projects will address one or several of these areas, depending on the outcome of the facilitation process.

A food security data challenge will support the Sustainable Development Goals (SDGs) identified by the United Nations. The goals are even more important now as they provide a critical framework for COVID-19 recovery. The goals are vital for a recovery that leads to greener, more inclusive economies, and stronger, more resilient societies. Australia is one of the 193 countries that signed on to the 2030 Agenda for SDGs and has committed to producing a report on implementation of the SDGs at least twice over the lifetime of the Agenda.

The ARDC will align with ongoing initiatives from the Australian government, state agencies, NCRIS facilities, universities, CSIRO, Australian Research Council, Rural Research and Development Corporations, industry and the Cooperative Research Centres (CRCs) such as Innovative Manufacturing CRC, CRC for Honey Bee Products, CRC for High Performance Soils, Food Agility CRC, Fight Food Waste CRC, Future Food Systems CRC and Northern CRC.

Furthermore, the projects will be established in alignment with Australian government priority frameworks including: the National Science and Research Priorities (Food and Soil and Water), the Modern Manufacturing Strategy (Food &

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[1] https://www.awe.gov.au/sites/default/files/documents/ag-2030.pdf

Beverage), the Blueprint for Critical Technology (opportunity to help us solve agricultural and environmental issues), the National Agricultural Innovation Agenda19, the National Climate Resilience and Adaptation Strategy20, and Australia's Long-Term Emissions Reduction Plan (Agricultural Industry). [road map]

In Scope Activities

Projects in the Food Security Data Challenges program will build digital infrastructure solutions to support research to improve Australia's production, consumption and distribution of safe and high-quality food. Projects will establish, develop or adopt national scale digital assets and deliver improvements to:

- Data collections
  - Discoverability and accessibility
  - Coverage
  - Quality and usability
  - Standards and interoperability
  - Capture and processing pipelines

- Analytical and access platforms
  - Modelling, visualisation and analytical tools
  - Interfaces to relevant data sources
  - Sophisticated access and authorisation for sensitive data
  - Collaborative environments

- Underpinning infrastructure
  - Storage
  - Compute

- Broader culture and policy frameworks
  - Community consensus building for adoption and implementation of the above
  - Legal and policy enablers
  - Governance and collaborative arrangements
  - Business models
  - Rewards and incentives
  - Awareness raising and human capability building

The improved infrastructure is the output of the project, including new multi-party governance and collaborative arrangements needed to sustain it.

Program Process

The development of projects within the Food Security Data Challenges program will take a participatory design approach. The ARDC will facilitate collaborative partnerships between government agencies, industry, research institutes and other relevant stakeholders.

The ARDC invites interested participants to register their interest via the online form. The ARDC will then host a series of participatory workshops and consultation meetings with registered stakeholders in order to build the collaborative scale and focus of the projects. Through these workshops, opportunities will be identified to align new research

infrastructure with existing research priority areas determined by state and federal government departments, research institutions, NCRIS and CRC food initiatives.

Discussions will focus on identifying the various data challenges and technological barriers that exist within these research priorities, such as access to relevant data, interoperability, data scale, data sensitivity, data analytics methods, data pipelines and data governance frameworks.

Through a series of roundtable discussions, potential solutions to overcoming these data challenges will be channelled into specific project proposals. Those organisations that participate in the workshops will be invited to submit proposals for projects.

The selection criteria to determine successful projects will be developed during the participatory design phase, including input from participants and experts. Decisions will be informed by the advice of the expert assessors. Successful projects are expected to commence mid-2022.
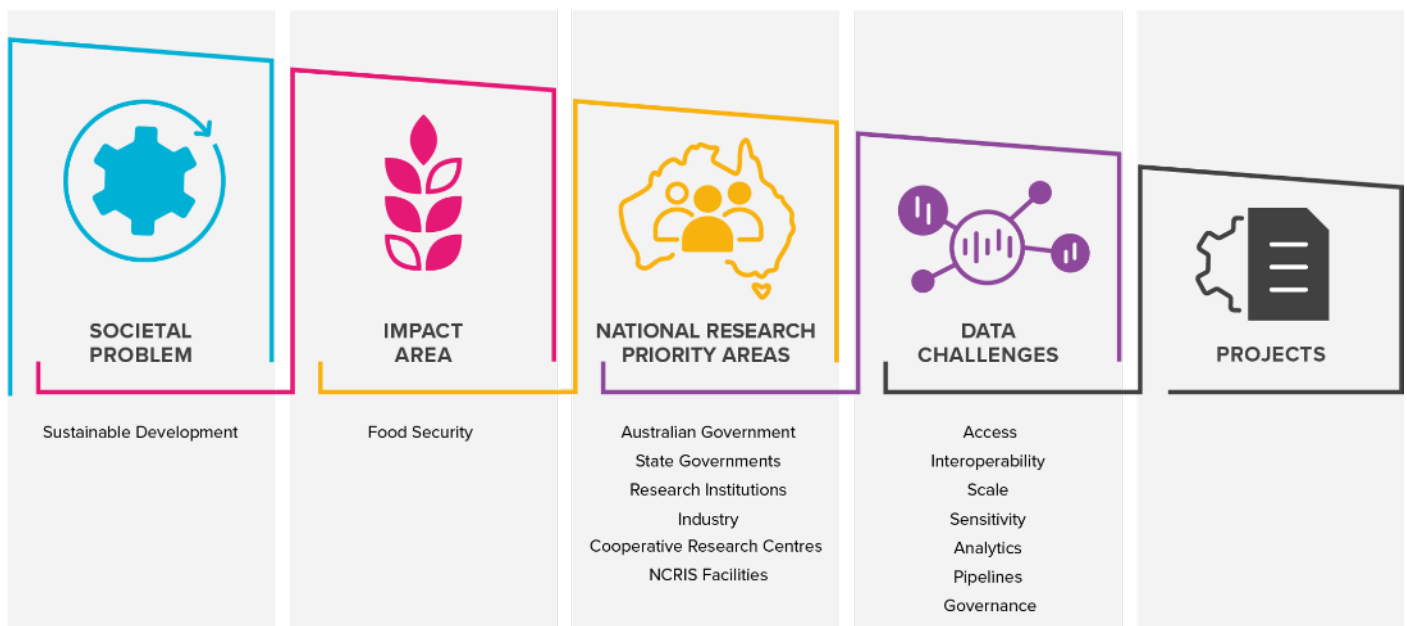

Figure 2: ARDC Translational Research Data Challenges on Food Security Funnelling Framework

Participants

Participants will take part in workshops and roundtable sessions to identify opportunities and design collaborative proposals to build national food security research digital infrastructure. Interest is sought from both potential users, beneficiaries, developers and operators of such infrastructure.

The Food Security Data Challenges program seeks to cross technological, cultural and organisational silos by bringing together collaborators from governments, research institutions (such as universities, NCRIS facilities, publicly funded research agencies and medical research institutes), industry and other relevant stakeholders. This will foster strong and enduring partnerships, while also ensuring a coordinated approach to solving the data challenges currently impeding the advancement of food security research. In particular, the contribution of Indigenous leaders will greatly empower this program. The ARDC invites interested participants across Australia to register their interest via the form at the bottom of the Food Security Data Challenges page.

Timeline

- Registration of interests: 15 February to 1 April 2022
- Participatory workshops: April-May 2022
- Roundtable sessions: Q2 2022
- Proposal development: Q3 2022
- Successful projects announcement: Q3 2022

Project Funding and Duration

While the scope of projects will depend on the outcomes of the consultation/facilitation phase (Feb-June), the ARDC will invest a total of $4.5 million in a number of Food Security projects, with an indicative limit of $1 million per project and a number of smaller projects. ARDC standard policy requires a 1:1 co-investment ratio between the ARDC's investment and that of all the other project participants combined. Co-investment must be in an auditable form and can be cash, or effort/labour. If contributing effort/labour, work on the project must be a significant amount of the person's time, i.e. 25% or more.

As well as financial investment, projects will be eligible for a number of resources provided by the ARDC, such as an embedded ARDC expert, support for communities of practice, cloud and compute allocation (confirmed for the duration of the project), specialist consultancy, and support for and access to ARDC national information services for identifiers, vocabularies and catalogues.

General Outline of Projects

Projects in the Translational Research Data Challenges program will have the following elements:

Inputs →	Activity →	Outputs →	Outcome →	Impact
Resources from: - ARDC - Research organisations - Public and private sector - Beneficiary groups	Changes to: - Data collections - Analytics and access platforms - Underpinning infrastructure - Culture and policy frameworks	Improved national infrastructure for translational research.	Use of this infrastructure for translational research applied to public sector service provision and policy and/or private sector business activity.	Improvements to: - Research efficiency - Environmental, social, economic benefits

← Formal project phase →	← Post project benefit realisation →

The formal project will typically finish after the 'outputs' stage above. It is expected that project participants will maintain the new capability as 'business as usual' as part of the national eResearch infrastructure. The ARDC will remain in formal communication with project participants beyond the outputs stage to monitor and report outcomes (research usage of the infrastructure) and impacts (improvements to research efficiency, as well as broader societal benefits).

Register Your Interest

If you would like to get involved in the workshops and roundtable sessions, please register your interest via the form at the bottom of the Food Security Data Challenges page.

Contact Us

If you have any questions please contact us.