Australia's National
Science Agency

Australian Agricultural Sustainability Framework

Data Analysis

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National Farmers Federation

Commercial-in-confidence

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Acknowledgments

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Executive summary

The primary goal of Phase 2 Element 4 of the Australian Agricultural Sustainability Framework was to understand the current data collection activities of existing agricultural industry sustainability frameworks, certification schemes, third-party certification schemes and supply chain organisations. To understand the data collection landscape, the following questions were explored:

- What data is being used to support these frameworks/schemes?
- What opportunities for harmonisation of these data might exist?
- What gaps exist between these programs and the needs of the Australian Agricultural Sustainability Framework (AASF).

Information discovery for the project was undertaken through interviews with individuals from a subset of existing frameworks/schemes. These were selected to be representative of a range of frameworks/scheme orientations and maturity. This was followed by a review of documentation provided by interviewees or published by the framework/scheme. The data collected (where data collection occurs) was then mapped against V2 of the AASF.

Findings from data analysis

Interviews and desktop analysis have revealed the following insights on current data collection activities across existing agricultural industry sustainability frameworks, certification schemes, third party certification schemes and supply chain organisations.

Current data collection

- Only a small number of industry sustainability frameworks are collecting data on a regular basis.
- Industry and third-party certification schemes often collect and use data to support their assessments but do not report this data.
- Supply chain companies are starting to think about data collection to support their own sustainability reporting, but little is being done, beyond planning, at present.

Data being collected

- There is little commonality between the data being collected by different groups.
- Much of the data being collected is qualitative and relates to indicators that are specific to the industry, making it difficult to translate or compare to other settings.
- No frameworks or schemes are collecting data about soil health or biodiversity at a national scale.
- All frameworks include criteria for which they have not defined indicators and hence are not collecting data.

Data collection methods

- There is a heavy reliance on surveys of individuals to support the industry frameworks. These surveys are conducted at varying frequencies and have varying levels of control.
- Interviewees reported that finding and acquiring data to support sustainability reporting can be time consuming and difficult.

Other relevant findings

- The data needs along supply chains vary according to the nature of the supply chains. In particular, supply chains where commodities are processed in bulk (eg. grains, some meat) rely on industry sector sustainability reporting whereas supply chains where the provenance of commodities can be traced (eg. some meat, wine) can use data collected at the farm level.
- There are parallel activities being undertaken to address agricultural data collection challenges that may be of interest. These include:
  - The Australian AgriFood Data Exchange Project
  - CSIRO's Trusted Agrifoods Exports Mission: Sustainability credentials framework to support agri-food exports
  - A collaboration between some broadacre agriculture sustainability frameworks.

Next steps

The project found that there is limited opportunity for reuse of data collected by existing sustainability frameworks/schemes. However, there is an opportunity to guide the development of a data sharing ecosystem in order to build on existing initiatives and create efficiencies in data collection.

The following activities are suggested 'next steps' for the AASF program:

1. Identify and review potential national scale publicly available data sets that might be used to seed the ecosystem.
2. Further explore the opportunity to develop an agricultural sustainability data ecosystem with key stakeholders. These stakeholders will include, but will not be limited to, government, existing sustainability frameworks and schemes, and supply chain organisations.
3. Engage with identified parallel activities to identify synergies and opportunities to cooperate on the development of a data sharing ecosystem.

1 Introduction

1.1 The Australian Agricultural Sustainability Framework Project

1.1.1 Background

The Australian Agricultural Sustainability Framework (AASF), funded by the Australian Government Department of Agriculture, Water and Environment (DAWE), is being developed by the National Farmers' Federation (NFF) to provide benefits to farmers and the community by promoting best practice in sustainability and biodiversity of natural resources and ensuring these efforts are recognised across the agricultural sector and beyond.

Figure 1 describes the place and purpose of the AASF within Australian agriculture.

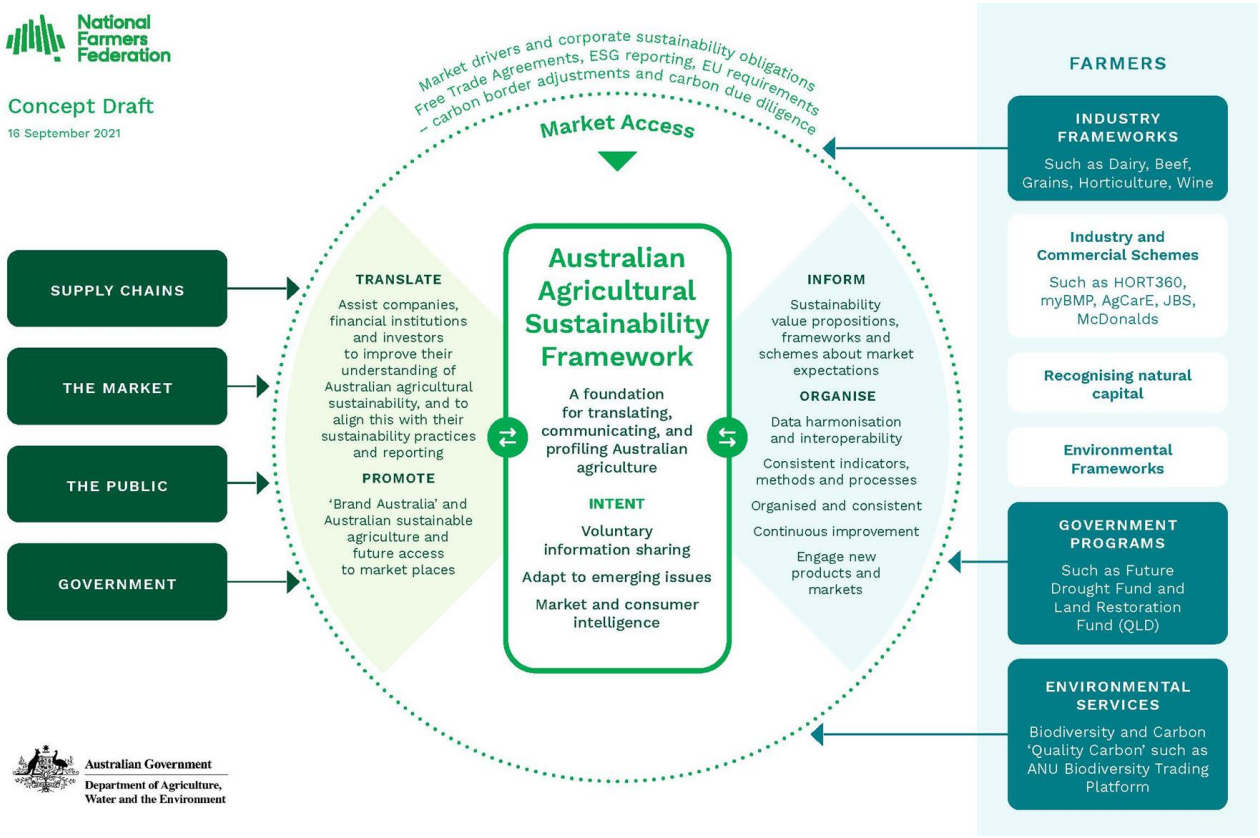


Figure 1 AASF place and purpose (Source: NFF website[1])

[1] https://nff.org.au/wp-content/uploads/2021/10/Nook_National-Farmers-Federation_Poster_V2.0_16-Sep-2021.pdf

1.1.2 Project details

Development of the AASF is a multi-phase program. Phase 2 (

Figure 2) will be completed in early 2022 and involves 6 integrated elements of work that include the following activities:

- delivering a framework for agriculture sustainability, including consideration of any legal, privacy or other (e.g. tax) implications in delivering the framework (Elements 1 and 6)
- working with agriculture-related organisations, such as rural research and development corporations, industry and private/not-for-profit companies, to incorporate and verify existing frameworks and schemes into and under a harmonised framework (Element 3)
- determining data and information needs to underpin the framework's success, including considering and addressing any gaps where applicable (Element 4)
- considering market opportunities, and how the framework could inform market-based decisions (e.g. the consumer at the supermarket shelf, trade opportunities, financing) to ensure the framework can deliver positive outcomes for farmers (e.g. premiums, increased market access, favourable interest rates) (Element 2)
- developing and delivering on a communications plan to engage with farmers, the broader industry and other relevant stakeholders, including articulating a robust value proposition to encourage participation. (Element 5)

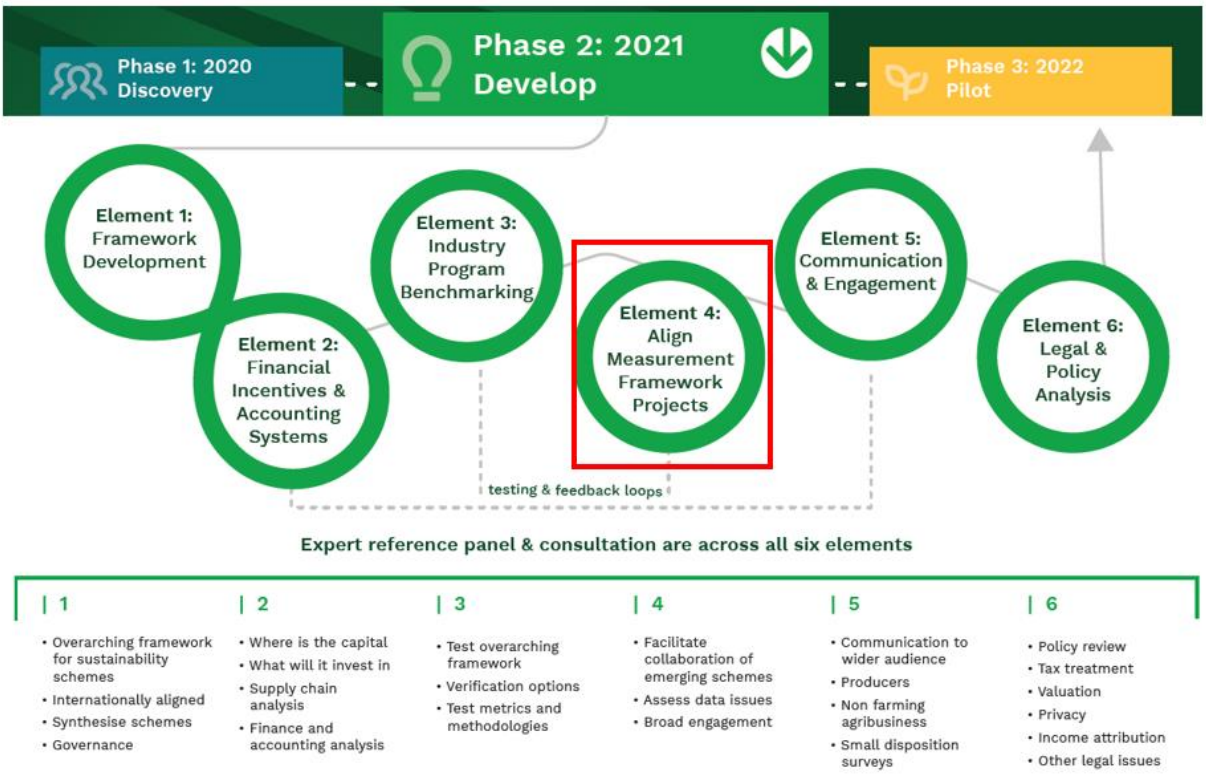


Figure 2 Developing the Australian Agricultural Sustainability Framework

The red box indicates the element pertaining to this report.
Source: modified from NFF Phase 2 explainer v.2.4

Phase 3 is due to be completed in late 2022 and may include a small trial of the framework, in collaboration with other activities in the DAWE Stewardship Package.

1.2 Element 4: Align Measurement Framework Projects

The purpose of Element 4 is to gather information and assess the alignment between a range of partner group approaches to data (existing, in design or aspirational with firm objectives) and the AASF. It is an important integration step in identifying the degree to which and where partner schemes and approaches can be mapped into the AASF, and to determine where gaps exist between partner schemes and that meta-standard. The main objectives for Element 4 are to:

1) understand the data landscapes of a variety of existing sustainability schemes and frameworks in the agricultural sector by gathering information on what data are being collected, from what sources and how these data are being used
2) determine the potential for current industry and market data collection to be used to support the AASF (inclusive of gaps).

1.3 About this report

This report details the findings of the activities undertaken within Element 4 to understand the data landscape of existing agricultural sustainability frameworks. The report is presented as follows:

- Section 2 details the approach used to consult with AASF stakeholders.
- Section 3 presents the findings based on the consultation.
- Section 4 lists opportunities and provides recommendations for future work and next steps.
- Interview questions and a summary of the account with a variety of interviewees are documented in Appendix A and Appendix B, respectively.

The research undertaken for this report was approved by the CSIRO Social and Interdisciplinary Science Human Research Ethics Committee (CSSHREC) - ethics clearance 132/21.

2 Approach

2.1 Context

Numerous sustainability reporting frameworks, best-practice frameworks and certification schemes are in operation or being developed across the Australian agricultural sector. These are being operated/developed by a range of different types of organisations including industry associations, private operators and third parties.

Although these frameworks and schemes vary, each collects data to measure progress and support reporting on progress towards achieving the stated goals of the framework or scheme.

Understanding the data being collected by existing and developing frameworks and schemes is the overall objective of Element 4; however, it is not possible to investigate every scheme and framework. Therefore, CSIRO investigated a representative sample. This approach involved the following actions:

1. Identify a core group of existing frameworks and schemes covering:
   - industry (producer) frameworks and schemes
   - industry (purchaser) schemes
   - third-party schemes.

   The core group should be broadly representative of the existing landscape of sustainability frameworks and certification schemes currently operating or in development within Australia. More information on the categories of frameworks and schemes is in Section 2.2.
2. Interview representatives from the core group asking the following questions:
   - What is the broad purpose of the framework/scheme?
   - What data are being collected to support their framework/scheme?
   - Where the data are being collected from?
   - What methods are used for data collection?
   - At what frequency is the data collected?
   - What are the data used for?
   - What challenges and opportunities exist with respect to data and data collection?

   Refer to Appendix A for further details about the interview questions.
3. Summarise each interview and return to interviewees to check accuracy.
4. Finalise interview summaries based on feedback from the interviewees.
5. Collate and review other available information (e.g. tools, reports, websites, papers) about each framework or scheme discovered independently or during the interview.
6. Where applicable, catalogue the data collected, including data source, for each framework and scheme.

7. Where applicable, map each framework catalogue against AASF V2.

8. Analyse findings and look for similarities, differences and gaps.

2.2 Framework/Scheme types

Each of the reviewed frameworks and schemes was categorised into one of four types. These are:

- Industry Frameworks – frameworks developed to support reporting on progress towards achieving a set of targets across an entire sector (e.g. dairy, beef).
- Industry Certification Schemes – developed within sectors to encourage adoption of best-practice approaches by individuals (e.g. BMP schemes).
- Third-party Schemes – like industry schemes, although here developed and operated by third parties. Usually focused on small number of issues (e.g. biodiversity). Often involve certification (but not always).
- Purchaser Schemes – frameworks and schemes developed and implemented by corporations along agri-food supply chains to support their own sustainability reporting requirements.

This categorisation is useful for understanding the context for the different data and data collection methods used within these frameworks and schemes.

3 Findings

3.1 Review of frameworks and schemes

Nineteen frameworks and schemes covering a broad range of industry, third-party certification and purchasers were reviewed. Table 1 shows the frameworks and schemes reviewed for this project.

Table 1 Frameworks and schemes reviewed in Phase 2 Element 4

FRAMEWORK/SCHEME	OWNER / LEAD DEVELOPER	TYPE	INTERVIEW DATE
Accounting for Nature	Accounting for Nature Ltd[a]	Third-party scheme	10th November 2021
Australian Farm Biodiversity Certification Scheme	ANU[b]	Third-party scheme	20th October 2021
Farm-scale Natural Capital Accounting	Latrobe University	Third-party scheme	5th November 2021
MSC Fisheries Standard	Marine Stewardship Council	Third-party scheme	26th October 2021
Hort360	Growcom	Industry certification scheme	20th October 2021
myBMP Cotton	Cotton Australia	Industry certification scheme	3rd November 2021
Sustainable Winegrowing Australia	Administered by the Australian Wine Research Institute with governance, endorsement and active support from Australian Grape & Wine and Wine Australia	Industry certification scheme	25th October 2021
Australian Beef Sustainability Framework	An initiative of the Red Meat Advisory Council, who appoints a Sustainable Steering Group to progress the framework.	Industry framework	5th November 2021, 10th November 2021
Australian Dairy Sustainability Framework	Dairy Australia	Industry framework	27th October 2021
Australian Egg Sustainability Framework	Australian Eggs	Industry framework	29th October 2021
Australian Sheep Sustainability Framework	Sheep Producers Australia (SPA) and Wool Producers Australia (WPA) lead the Framework, with Australian Wool Innovation (AWI) and Meat & Livestock Australia (MLA) providing funding, strategic advice and secretariat support.	Industry framework	No response
Behind Australia's Grains	Driven by GrainGrowers, the framework is a joint initiative of Australia's grains industry organisations.	Industry framework	8th November 2021
PLANET. PEOPLE. PADDOCK	Cotton Australia	Industry framework	3rd November 2021
Ricegrowers Promise	Australian Ricegrowers Association	Industry framework	28th October 2021
Fonterra	na	Purchaser	8th November 2021

FRAMEWORK/SCHEME	OWNER / LEAD DEVELOPER	TYPE	INTERVIEW DATE
JBS Foods Australia	na	Purchaser	27th October 2021
McDonald's	na	Purchaser	11th November 2021
SunRice	na	Purchaser	18th November 2021
Tyson Foods Australia	na	Purchaser	18th November 2021
Woolworths	na	Purchaser	12th November 2021

na = not applicable

[a] an independent entity that was set up by the Wentworth Group

[b] IP owned by Australian Government

3.1.1 Industry frameworks

Six industry frameworks were reviewed. The purpose of these frameworks varies from promoting performance of the industry at a national level, to building community trust and providing a process for public engagement, to demonstrating performance against issues of public interest and concern. Several of the frameworks reviewed communicate progress and performance through report cards that outline targets and achievement against those targets.

Of the six frameworks reviewed, three (Beef, Dairy and Eggs) can be considered relatively mature. That is, the owners of these frameworks believe that development is complete or near complete, data collection has commenced, and the framework is serving its intended purpose. The remaining frameworks are in varying stages of development and have only begun considering data collection.

Further information about these frameworks is in Appendix B

Data

Table 2, Table 3, Table 4 and Table 5 present the type of data collected by existing industry frameworks mapped to AASF v2 categories along with the number of frameworks collecting that data and the methods of data capture. Note that:

- The data collected varies widely.
- Some categories have no data currently collected.
- Even the most mature frameworks have indicators for which they have not defined metrics and hence are unable to measure. Particular challenges are:
  - Biodiversity – no clear definition of what it is and how to measure it
  - Soil Health – expensive to measure.

Other findings:

- Three of the six (Beef, Grains and Cotton), along with another framework (Sheep), have been working together to develop a list of common data sets that they see as being useful across all their frameworks.
- One of the six (Eggs) is collecting only consumer sentiment data.

Data sources

- The sources of data vary widely between frameworks.
- There is a significant reliance on data from surveys of individual farmers or consumers. These surveys are conducted by the industry, the associated Research Development Corporation (RDCs) or third parties. The surveys vary in frequency (how often they are conducted) and data quality.
- Other data sources, comprising a mix of compliance, industry scale and industry-specific data, include:
  - industry reporting
  - commissioned studies and reports
  - published models
  - publicly available data (ABS, ABARES, SafeWork Australia).

Data collection

- Those collecting data reported that finding data to support measuring indicators can be very difficult. In one case, the owner of a framework had invested in consultancies to find data.
- Several frameworks have access to sophisticated data management systems, which may be able to support some aspects of their frameworks. (e.g. MLA'S Integrity Systems[2] and Dairy Australia's DairyBase[3]).

Refer to Appendix B for more detailed information about these frameworks.

Table 2 Environment Theme aligned data collection by Industry Frameworks

AASF CATEGORY	DATA[4]	NUMBER OF FRAMEWORKS	COLLECTION METHOD
Greenhouse Gases and Air	Units of CO2e per commodity unit	2	Farmer survey, modelled, industry reporting
	% of carbon captured and re-used	1	Modelled
Soil and Landscapes	% of farmers that complete and implement a soil and nutrient management plan	1	Farmer survey

[2] https://www.integritysystems.com.au/

[3] https://www.dairyaustralia.com.au/dairynsw/farm-business/dairybase

[4] In some cases, data are modelled rather than collected

AASF CATEGORY	DATA[4]	NUMBER OF FRAMEWORKS	COLLECTION METHOD
Biodiversity	% of farmers that have and implemented a documented biodiversity action plan	1	Farmer survey
	% national forest/woodland gain/loss	1	Remote sensing (commercial provider)
	% regions achieving healthy groundcover	1	Remote sensing (commercial provider)
Water	Volume of water consumed per commodity unit produced	2	Industry reporting, modelled
	% farmers recycling water	1	Farmer survey
	% farmers monitoring water consumption	1	Farmer survey
	% of farmers with water security management plan	1	Farmer survey
	% stock excluded from waterways	1	Farmer survey
Materials and Energy	% of waste recycled	1	Farmer survey
	Tons of waste per commodity unit processed	2	Industry reporting, modelled

Table 3 People and Community Theme aligned data collection by Industry Frameworks

AASF CATEGORY	DATA	NUMBER OF FRAMEWORKS	COLLECTION METHOD
Human Health, Safety and Wellbeing	No. of non-compliant chemical residues found in product analysis	1	Industry survey
	No. of product recalls due to food contamination	1	Product Safety Recalls Australia
	% of exported product not accepted by market	1	Commissioned report
	Consumer sentiment	1	Consumer surveys
	Access to and use of antibiotics	1	Survey
	% covered by antibiotic stewardship plan	1	Survey
	Workplace fatalities	2	Safe Work Australia
	Loss Time Injury Frequency Rate (LTIFR)	1	Safe Work Australia
Livelihoods	% of farmers achieving benchmark price per unit	1	Industry data base
	% of employees retained within the industry year on year	1	Survey
	% of farm owners that have an agreed farm transition/succession plan	1	Farmer survey
	Farm business Profit	1	Australian Agricultural and Grazing Industries Survey (ABARES)
	Total farm productivity	1	Australian Agricultural and Grazing Industries Survey (ABARES)

AASF CATEGORY	DATA	NUMBER OF FRAMEWORKS	COLLECTION METHOD
	Costs of production	1	Australian Agricultural and Grazing Industries Survey (ABARES), modelled
	Market Access	1	Report
	Costs of trade barriers	1	Report
	Global Life Satisfaction	1	Farmer survey
Rights, Equity and Diversity	Gender diversity	1	Workplace Gender Equality Agency
	Age diversity	1	Survey
	Indigenous representation	1	Survey
Social Contribution	Value of payments made to farmers	1	Industry reporting
	No of people directly employed in the industry	1	Industry reporting
	% of farmers that say their employees actively participate in community activities	1	Farmer survey
	% of farmers who believe it's important to support community initiatives	1	Farmer survey
	% of industry members who agree their community has effective leaders	1	UC Regional Wellbeing Survey
	% of community that see industry as vital to the Aus economy	1	Survey
	% of people in regional areas who think industry is essential part of their community	1	Survey
	% of farmers who agree local community appreciates the role they play.	1	Survey
Animal Wellbeing	% of farmers who aware of/have copy of Standards and Guidelines	2	Survey
	% of farmers who agree that complying with standards is essential	1	Survey
	% compliance with standards	1	Survey
	Vaccination rates	1	Survey
	% of (industry specific[5]) on farm practices	1	Survey
	Reportable incidents	1	DAWE
	% of consumers that believe farmers do a good job caring for animals	1	Survey

[5] A number of industry specific animal welfare practices are monitored. These include tail docking, mulesing, calving induction, use of pain relief and more.

Table 4 Economic Resilience Theme aligned data collection by Industry Frameworks

AASF CATEGORY	DATA	NUMBER OF FRAMEWORKS	COLLECTION METHOD
Good Governance	–[6]	0	–
Fair Trading	–	0	–
Biosecurity	% of farmers that have a documented biosecurity plan	2	Survey

Table 5 Unaligned data collection by Industry Frameworks

AASF CATEGORY	DATA	NUMBER OF FRAMEWORKS	COLLECTION METHOD
Unaligned	% increase in industry's share of global trade	1	Industry reporting
	Increase in RD&E expenditure	1	Unknown
	% of farmers looking for new information to improve business	1	Survey
	% of farmers reporting new ideas were important	1	Survey
	% of farmers reporting they were amongst the first in their area to try something new	1	Survey
	No of traineeships and apprenticeships	1	National Centre for Vocational Education Research
	% of industry participants with higher education qualification	1	Survey
	% of consumers that believe range of products meets their needs	2	Survey

Other observations

During interviews, Industry Framework members also noted that:

- Despite there being agreement on a number of sustainability criteria and indicators, there is little comprehensive data supporting some of them making measurement or calculation difficult.
- Reducing indicators to a small number of key metrics that are useful for a range of users is difficult.
- Collecting and analysing the data required to deliver meaningful outputs is expensive as data comes from multiple places and involves manual effort to collate. Scaling data up to represent an entire sector can also be expensive. This results in some frameworks resorting to less expensive data, which is a less reliable measure. Some felt that more digitisation of data and automation of collection would reduce costs.
- Data collected by government agencies such as ABS or ABARES is, in some cases, not fit for purpose, and does not keep up with changes in activity or strategy. It is also difficult to influence

[6] '–' indicates that data is not collected by any framework

the data collected by these surveys. This includes the timing of data collection, resulting in an inaccurate understanding of the industry.

- There is an opportunity for information sharing between RDCs. Many RDCs currently undertake grower surveys and there is an opportunity for these to be coordinated. For example, some sustainability related questions could be made common to all surveys.
- It can be difficult to access privately held data for the purpose of measuring some indicators.
- Many farms produce multiple commodities (stock and crops, multiple crop types, etc), whereas most sustainability reporting assumes single commodities are produced. This raises concerns for some sustainability frameworks as it is unclear how to apportion sustainability outcomes for these farms.
- Many growers see data entry as a task that generates little value for them. Furthermore, growers are being asked to enter data into multiple systems of varying sophistication. There is an opportunity for system consolidation and improvement of the data entry experience. There are also opportunities for greater automation of data capture and data sharing.
- Some observed that some organisations (eg. Safe Work Australia, Food Safety ANZ) are asked for the same data by multiple organisations and it would be more efficient if they were asked once, and the data broken down by sector.

3.1.2 Industry certification schemes

The review investigated three industry certification schemes. These are schemes developed and implemented by industry bodies, often with the goal of improving on farm practices to achieve sustainability outcomes.

A key difference between these schemes and industry frameworks is that the target is individual farms and related processing and hence data gathered by them is not necessarily representative of the entire industry.

Data

In general, certification schemes do not collect data against a set of indicators in the way industry sustainability frameworks do. Rather, they assess the degree to which agreed sustainability related practices or goals are undertaken/met on farm or during processing. This may be as simple as ‘yes, it is’ or ‘no, it isn’t’ (e.g. Cotton Australia’s MyBMP) or a rating (e.g. Hort360 gives a score out of 4). Certification is achieved once it is assessed that a certain pre-determined level of compliance has been achieved.

Furthermore, while data might be collected as evidence that a certain practice is being undertaken, it is rare that the scheme maintains this data in any usable form.

Table 6, Table 7, Table 8 and Table 9 indicate the type of criteria used by the reviewed schemes mapped to AASF v2 categories along with the number of schemes using that criteria.

Data sources

All data collected for the reviewed industry certification schemes comes from the farmer/grower/producer.

Data collection

Industry certification schemes use a variety of methods to collect data. Of the schemes reviewed, the most common approach to achieve full certification is self-assessment through an online form for initial data capture followed by an in-person audit by an authorised auditor.

Table 6 Environment Theme aligned Industry Certification Scheme criteria

AASF CATEGORY	SCHEME CRITERIA	#	COLLECTION METHOD
Greenhouse Gases and Air	Consideration and management of carbon sequestration and emissions	1	Questionnaire
	Air quality and noise management	2	Questionnaire
Soil and Landscapes	Management of crop nutrient requirements	3	Questionnaire
	Assessment, maintenance and improvement of soil structure	3	Questionnaire
	Monitoring and management of erosion risks	1	Questionnaire
	Identification and recording of natural resources	1	Questionnaire
	Management of stock in riparian zones	1	Questionnaire
	Stabilisation of riverbanks and waterways to reduce erosion	2	Questionnaire
Biodiversity	Maintenance and improvement of the diversity of native plants and animals	3	Questionnaire
	Maintenance of groundcover	1	Questionnaire
	Maintenance or improvement of native vegetation connectivity	1	Questionnaire
	Maintenance of habitat and vegetation in riparian zones	2	Questionnaire
Water	Recording and use of information to make better irrigation decisions	2	Questionnaire
	Management of storage and distribution systems	2	Questionnaire
	Design, installation and management of irrigation systems	3	Questionnaire
	Use of rainfall	2	Questionnaire
	Prevention of off-farm water quality impacts	3	Questionnaire
	Management of impact of tailwater and stormwater runoff	3	Questionnaire
Materials and Energy	Monitoring of farm energy usage	3	Questionnaire
	Design of irrigation pump stations	1	Questionnaire

AASF CATEGORY	SCHEME CRITERIA	#	COLLECTION METHOD
	Measurement of pump performance	1	Questionnaire
	Optimising energy usage in tractors	2	Questionnaire
	Dispose of chemical containers and unwanted chemical appropriately	1	Questionnaire
	Waste Management and recycling	2	Questionnaire

Table 7 People and Community Theme aligned Industry Certification Scheme criteria

AASF CATEGORY	SCHEME CRITERIA	#	COLLECTION METHOD
Human Health, Safety and Wellbeing	Commitment to work health and safety	2	Questionnaire
	Consultation about work health and safety	2	Questionnaire
	Management and control of hazards and risks in the workplace	2	Questionnaire
	Provision of a safe working environment	2	Questionnaire
	Safety reporting	2	Questionnaire
	Workers compensation and return to work	2	Questionnaire
Livelihoods	Training, career development and farm succession planning	3	Questionnaire
	Financial and business management	1	Questionnaire
Rights, Equity and Diversity	–	0	–
Social Contribution	–	0	–
Animal Wellbeing	–	0	–

Table 8 Economic Resilience Theme aligned Industry Certification Scheme criteria

AASF CATEGORY	SCHEME CRITERIA	#	COLLECTION METHOD
Good Governance	Contractors are managed appropriately	1	Questionnaire
	A process in place for employing people	1	Questionnaire
	Wages and Conditions in accordance with the Fair Work Act 2009	1	Questionnaire
	A process is in place to ensure fair treatment of employees	1	Questionnaire
	A process is in place for ending employment	1	Questionnaire
Fair Trading	–	0	–
Biosecurity	People are made aware of biosecurity	1	Questionnaire
	All crops and farm inputs are monitored	2	Questionnaire
	Management of movement and cleanliness of vehicles, machinery and equipment	3	Questionnaire

Table 9 Unaligned Industry Certification Scheme criteria

AASF CATEGORY	SCHEME CRITERIA	#	COLLECTION METHOD
Unaligned	Insect, Weed and Disease Management	2	Questionnaire
	Pesticide Management	3	Questionnaire
	Petrochemical Storage and Handling	1	Questionnaire
	Climate	1	Questionnaire
	Nutrient Management	1	Questionnaire

Other observations

Members of this group also noted that:

- Data literacy with many growers can be poor leading to delays in data entry, reticence to provide data and poor data accuracy.
- The use of Farm Management software systems varies greatly. Many small producers do not have access to such systems. This results in poor data management practices.
- Some schemes have had initial discussion with supply chain companies (e.g. supermarket retailers) about the opportunity to work together.
- Participation in these schemes is voluntary. While some have had significant initial uptake, without a market driver, there is often little incentive to maintain certification.

Refer to Appendix B for more detailed information about these schemes.

3.1.3 Third-party certification schemes

Four third-party schemes were reviewed for the project. Of the schemes reviewed:

- One (the Marine Stewardship Council - MSC) is a very mature international scheme and has been in operation around the world for some time. The other three are Australian schemes and in varying stages of development.
- Three of the schemes deliver a certification to the participant, whereas the fourth (Farm-scale Natural Capital Accounting - FSNCA) does not.
- The scopes of the four schemes are different. The Australian Farm Biodiversity Certification Scheme (AFBCS) is targeted purely at on-farm biodiversity. Accounting for Nature (AfN) and FSNCA use accounting methods to account for the environment and environmental benefits on farm. MSC focuses on the management of wild fisheries.
- Like industry certification schemes (Section 3.1.2), the primary targets of these schemes are individual farms, projects or, in the case of MSC, fisheries. As such, they do not collect data at an industry/sector scale.

Data

Data collected for these schemes is highly dependent on the nature of the scheme.

- In the case of the Australian Farm Biodiversity Certification Scheme (AFBCS), publicly available data sets such as landcover classification, landuse mapping, vegetation extent, and land capability mapping are used as inputs. This is used to undertake an initial analysis and then followed with an on-farm audit.
- Similarly, the Farm-scale Natural Capital Accounting (FSNCA) project includes publicly available remote sensing data as an input.
- Data collected for Accounting for Nature (AfN) projects depends on the methods to be used for individual projects.
- The Marine Stewardship Council Certification Scheme is similar to the industry certification schemes in that the data collected is used only as evidence that a particular requirement of the standard has been met.

Data sources

Just as the data collected by these schemes varies, the data sources also vary. One constant is that a significant proportion of the data will be collected on-farm (fishery). In the case of the MSC and AfN, data from the farm/fishery is the single largest source of data. FSNCA and AFBCS also use data collected on-farm and supplement this with publicly available data from state and Commonwealth agencies.

Data collection

Data collection methods also vary across these schemes. In some cases, data are collected by scheme administrators and auditors. In other cases (AfN), the farmer/grower collects and submits field data for analysis.

Other observations

Members of this group also noted that:

- The frequency, temporal reliability (currency), scale and general accuracy of some of the input data (both publicly available and research based) used by some of these schemes is such that it limits usefulness for more intensive agriculture.
- Those schemes that require site visits have a high cost of entry associated with them. This is a barrier if it is expected that landholders will cover this expense.
- As with other frameworks and schemes, the measurement of biodiversity remains a problem. Some are using remotely sense data which is useful but has limitations (not able to measure under the canopy). Emerging technologies may address these issues.

3.1.4 Supply Chain Corporations

The project also looked at the data being collected by supply chain companies (organisations down the supply chain from growers) to understand their needs and challenges with respect to data for sustainability reporting. Key findings are:

- Most are thinking about/have thought about their data needs, but little data is being collected specifically for sustainability reporting purposes.
- Where data is collected, it varies widely. For example:
  - McDonald's reported that they collect information on the percentage of products they source that meet adopted certification standards.
  - Fonterra collects a range of information via their farm diary.
  - JBS operates a certification scheme, similar to other certification schemes reviewed. Like these other certification schemes, certification requires evidence, in the form of data, that various requirements have been met.
  - SunRice mandates the provision of some data from suppliers.
- There is a difference in data needs depending upon the type of supply chain the organisation is operating in. This finding is discussed in Section 3.2.
- Some agricultural sectors are recognised as being 'data rich' and the supply organisations recognise an opportunity to exploit this. The dairy industry, for example, involves data collection all along the supply chain. Some data are collected on a daily basis whereas other data are collected less regularly. Importantly, there is growing acceptance of data collection within the industry and the value this data can bring when used appropriately.
- Some recognised that there is a short window of opportunity to develop standards to support the exchange of sustainability related data. At present, very little data is collected, and even less is collected on a routine basis. However, it is likely that data requests/demands from suppliers will increase in the future. Without standards, it is likely that these requests will be for different data and presented in different forms. This will place a significant overhead on suppliers who supply multiple requesting organisations. Standards on what is requested and the form in which it is presented will significantly ease this pain.

3.2 Bulk Supply Chains vs Single Source Supply Chains

One of the reasons to include supply chain companies in the review was to understand what happens with data along these chains and the data requirements of these organisations. As Section 3.1.4 described, the current state and data needs for the organisations reviewed vary markedly.

However, during the analysis, it became apparent that there is a clear difference between different types of supply chains and the ability to use data collected long these chains. It was

noted that data on sustainability can be accessed from the source in supply chains where the point of origin for a commodity could be traced, or the commodity can be certified. For example, seafood caught within certified fisheries.

However, for those supply chains where commodities are handled in bulk (grains, some meat), access to data from the point of origin is more difficult. In these supply chains, whole of industry sustainability data becomes more important.

3.3 Related activities

During the exploration phase of this activity, the project team were made aware of three activities that may be of interest to the further development of the AASF.

3.3.1 Australian AgriFoods Data Exchange Project

During the interview process, and number of interviewees pointed to the Australian AgriFoods Data Exchange Project.[7] According to the website, this project "seeks to provide a digital platform that enables:

- The permissioned exchange of data between AgriFood industry participants;
- Timely access to information that supports decision making for the AgriFood value chain;
- Release management capacity;
- Standardisation and consistency of industry data assets;
- The capacity to adapt, incorporating new use cases for data exchange that deliver value and support resilience of AgriFood value chain participants; and
- Increased transparency of AgriFood industry data to support multiple use cases (e.g. regulatory compliance, collaboration between public & private data sets)."

At present the project has identified, through consultation, a small set of use cases that it is pursuing. These include sharing of compliance and certification data, biosecurity and contamination data, benchmarking data and data to support traceability.

The project has also stated there is an opportunity for further use cases to be added if funding becomes available.

3.3.2 Trusted Agrifoods Exports Mission: Sustainability credentials framework to support agri-food exports

The 'Sustainability Credentials Framework to Support Agri-Food Exports' project is funded through CSIRO's Trusted Agrifoods Exports Mission and forms part of the mission's Market Access work package. It is investigating current and emerging sustainability-related requirements for access to international markets with a view to support the development of sustainability credentialing frameworks to meet those requirements. The goal is to reduce the compliance costs and allow more producers to benefit from access to high value markets.

The primary motivation for the project is a recognition that sustainability credentials are increasingly required for market access and providing sustainability credentials backed by evidence is complex. A whole of supply chain approach to benchmarks, data collection and reporting is required for generating evidence to underpin sustainability claims for Australian agricultural exports.

[7] http://www.ozagdx.com.au/

The specific research questions being addressed by the project are:

- Which metrics/credentials are currently required/requested?
- What data points are required to support compliance with those? How much overlap is there in data requirements for different metrics?
- Where could those data be sourced from and which data are currently missing?
- How does Australia compare to other countries, both in terms of effort to generate evidence and of actual sustainability results?
- What metrics/credentials are likely to be required in the future?
- Which metrics are "locked in" and which may be influenced by Australia?

The project aims to develop sustainability credentialing frameworks to meet market-access-related requirements for selected agricultural commodities. This involves creating clarity around those requirements and developing frameworks that could potentially meet requirements for selected sustainability areas.

The project approach is:

- Identify market-access related sustainability credentialing requirements. (complete).
- Conduct deep-dive studies for selected commodities to develop sustainability credentialing frameworks. (work in progress).
- Explore sustainability credentials for future market access and analyse Australia's role in developing certain sustainability metrics.

The project will deliver

- A review of current and emerging sustainability-related market access requirements to provide an informed understanding of the current landscape.
- Three deep-dive studies to develop credentialing frameworks for measuring selected sustainability impacts along the value chain.

3.3.3 Broadacre Sustainability Metrics

During investigations for this report, it was discovered that five broadacre agricultural sectors (cotton, grains, beef, sheep and wool) have been working collaboratively to align sustainability metrics to facilitate a whole of farm view and deliver uniform sustainability reporting. This is being undertaken as these sectors recognise that many farms produce multiple commodities (crops and livestock) and they wish to ensure that sustainability metrics and the data used to measure these are consistent.

As part of this alignment work, the consortium has identified key areas where data are lacking and areas for data improvement. These are listed in Table 10.

Table 10 Broadacre Group identified data needs (adapted from document supplied)

PRIORITY DATA	RATIONAL
Carbon Sequestration	Market access and social license drivers to support environmental outcomes. Agriculture's carbon store opportunity is real but can't be measured at an industry scale. Need this captured to present balanced view of agriculture's GHG profile, recognising need to manage expectations and consider Australia's unique natural capital ("soils ain't soils"). Needed for further carbon offset market development
Soil Health	Key to productivity and fundamental to environment. Tenet of regenerative agriculture concept & important for agriculture to define this given increasing focus of food manufacturing/supermarkets. No consistent approach across geographies nor commodity, and cannot be measured at an industry scale
Ground Cover	This is important for both soil health (erosion management) and carbon. Different regions have different thresholds. Regionally, some data exists, but applying it consistently at a national scale is difficult.
Biodiversity	Poor Australian performance and agriculture in the firing line given use of 51% land. National standards coming via EPBC Act. Pinch point of agriculture's social licence Potential ecosystems services market creation which benefits broadacre agriculture.
Water Use Efficiency	Identified in all materiality tests and big social licence issue Fundamental to farmers operating in drying climate (dryland/irrigation)
Workforce Capacity	Ensure workforce has the capacity and capabilities needed –now and in future. Succession planning and resources needed to ensure accessibility to industry Address current gender, age, and indigenous imbalance
Workface Safety	Poor safety record and dangerous industry Underpins overall wellbeing Limited reporting available and more detail would facilitate more targeted action to mitigate workforce risks.

4 Summary, conclusions and recommendations

4.1 Summary

The primary goal of this project was to review the current data collection activities of existing agricultural industry sustainability frameworks, certification schemes, third-party certification schemes and supply chain organisations. This is to understand what data is being used to support these frameworks/schemes, what opportunities for harmonisation of these data might exist and what gaps exist between these programs and the needs of the Australian Agricultural Sustainability Framework (AASF).

Information discovery for the project was undertaken through interviews with individuals from a representative set of frameworks/schemes. This was followed by review of documentation provided by interviewees or published by the framework/scheme. The data collected (where data collection occurs) was then mapped against V2 of the AASF.

This study has found that:

- On current data collection:
  - Only a small number of industry sustainability frameworks are collecting data on a regular basis.
  - Industry and third-party certification schemes often collect and use data to support their assessments but do not report this data.
  - Supply chain companies are starting to think about data collection to support their own sustainability reporting, but little is being done, beyond planning, at present.
- On the data being collected:
  - There is little commonality between the data being collected by different frameworks/schemes.
  - Much of the data being collected relates to indicators that are specific to the industry undertaking the collecting.
  - No framework or scheme is collecting data about soil health or biodiversity at a national scale.
  - All industry frameworks include criteria for which they have not yet defined indicators and hence are not collecting data.
- On data collection methods:
  - There is a heavy reliance on surveys of individuals to support the industry frameworks. These surveys are conducted at varying frequencies and have varying levels of control and confidence.
  - Interviewees reported that finding and acquiring data to support sustainability reporting can be time consuming and difficult.

The study also found that:

- The data needs along supply chains vary according to the nature of the supply chains. Supply chains where commodities are processed in bulk (eg. grains, some meat) rely on industry sector sustainability reporting whereas supply chains where the provenance of commodities can be traced back to source (eg. some meat, wine) can use data collected at the farm level.
- There are parallel activities being undertaken to address agricultural data collection challenges that may be of interest to the AASF project. These include:
  - The Australian AgriFood Data Exchange Project
  - CSIRO's Trusted Agrifoods Exports Mission: Sustainability credentials framework to support agri-food exports
  - A collaboration between some broadacre agriculture sustainability frameworks

4.2 Conclusions and recommendations

The findings from this review suggest that the data landscape for agricultural sustainability reporting is in its early stages of formation. While there are some industry sectors that have relatively mature data collection programs (dairy and beef), other sectors are in the planning/development phases. No existing framework is collecting data against all its identified sustainability criteria.

Given this state, there would appear little immediate opportunity to reuse/repurpose current data collection by existing industry sector sustainability frameworks to support reporting against the AASF.

However, there is an opportunity for collaboration to support the development of an agricultural sustainability data ecosystem. This would support the use/reuse of sustainability data for multiple purposes along supply chains in the future and create efficiencies for stakeholders in undertaking sustainability reporting. It will also support further development of existing frameworks and schemes in a broadly consistent way.

To develop this ecosystem the following actions are recommended:

- Work with key stakeholders to co-design the ecosystem to ensure it is fit for purpose and meets the needs of all stakeholders.
- Implement appropriate governance to support and guide the data sharing ecosystem. This will address: scope of the ecosystem, how decisions are made and by whom; funding of activities and functions of the infrastructure supporting the eco system.
- Work across agricultural industry sectors to identify opportunities for harmonisation of sustainability indicators so that data can be collected at a whole of industry scale. This would enable greater use of the data and enable more efficient data capture. A key focus here would be the many industry sector level surveys undertaken.
- Work with key data providers (e.g. ABS, ABARES, Safe Work Australia, the agricultural research, development corporations and, in the future, the private sector) to influence the data they are collecting and how they are reporting it to enhance sustainability reporting at all levels of the industry.

- Develop appropriate standards to support data sharing within and across the ecosystem. These standards need to at least address content (the information being shared) and interfaces (the mechanisms through which the information shared).
- Support key data providers and users to adopt the standards indicated above. This may include funding for information infrastructure development.
- Creating and supporting appropriate fora to discuss and advance solutions for collection and sharing of sustainability data.

The work being undertaken by the broadacre agricultural sectors (Section 3.3.3) suggests that there is already a willingness from some within agriculture to work together to achieve shared outcomes with respect to sustainability data.

A mechanism that might be explored to assist in the development of the data sharing ecosystem is the Australian AgriFood Data Exchange Project (Section 3.3.1). This program has stated that they are looking for further use cases. Meeting the data requirements to support the needs of both the AASF as well as individual commodity level reporting could be put forward as a possible use case.

4.3 Next steps

Building a data sharing ecosystem takes time and investment. As has been found by this review, many of the potential stakeholders in such an ecosystem are at different stages in their sustainability journeys and have made, in some cases, significant investments already. However, the work undertaken by the broadacre agriculture sectors indicates there is a willingness to work together.

The following activities are suggested ‘next steps’ for the AASF program:

1. Identify and review potential national scale data sets that might be used to seed the ecosystem. Ideally these data sets will:
    a. be already being collected
    b. be publicly available
    c. contain indicators that can be used to assess AASF criteria at both the ‘whole of agriculture’ and ‘industry sector’ (eg. beef, cotton, etc) levels.
2. Further explore the opportunity to develop an agricultural sustainability data ecosystem with key stakeholders. These stakeholders will include but not be limited to government, existing sustainability frameworks and schemes and supply chain organisations.
3. Engage with identified parallel activities to identify synergies and opportunities to cooperate on the development of a data sharing ecosystem.

Performing these three steps will not result in the formation of a data sharing ecosystem. They are initial steps to test the opportunity and determine the interest from stakeholders. Furthermore, creating a data sharing ecosystem across the agricultural industry is unlikely to be achieved by just one organisation. It requires a shared desire to participate. Undertaking these steps will help determine what will need to be done to achieve progress.

Appendix A Interviews

A.1 Approach Email

Dear <insert name>,

I work for the CSIRO. We have been engaged by the National Farmers Federation (NFF) to undertake a review of data needs and identify opportunities for harmonisation as part of Phase 2 of the development of the Australian Agricultural Sustainability Framework (AASF). Specifically, our project is focused on data harmonisation and interoperability in order to understand the data needs underpinning the AASF and existing sustainability frameworks and schemes.

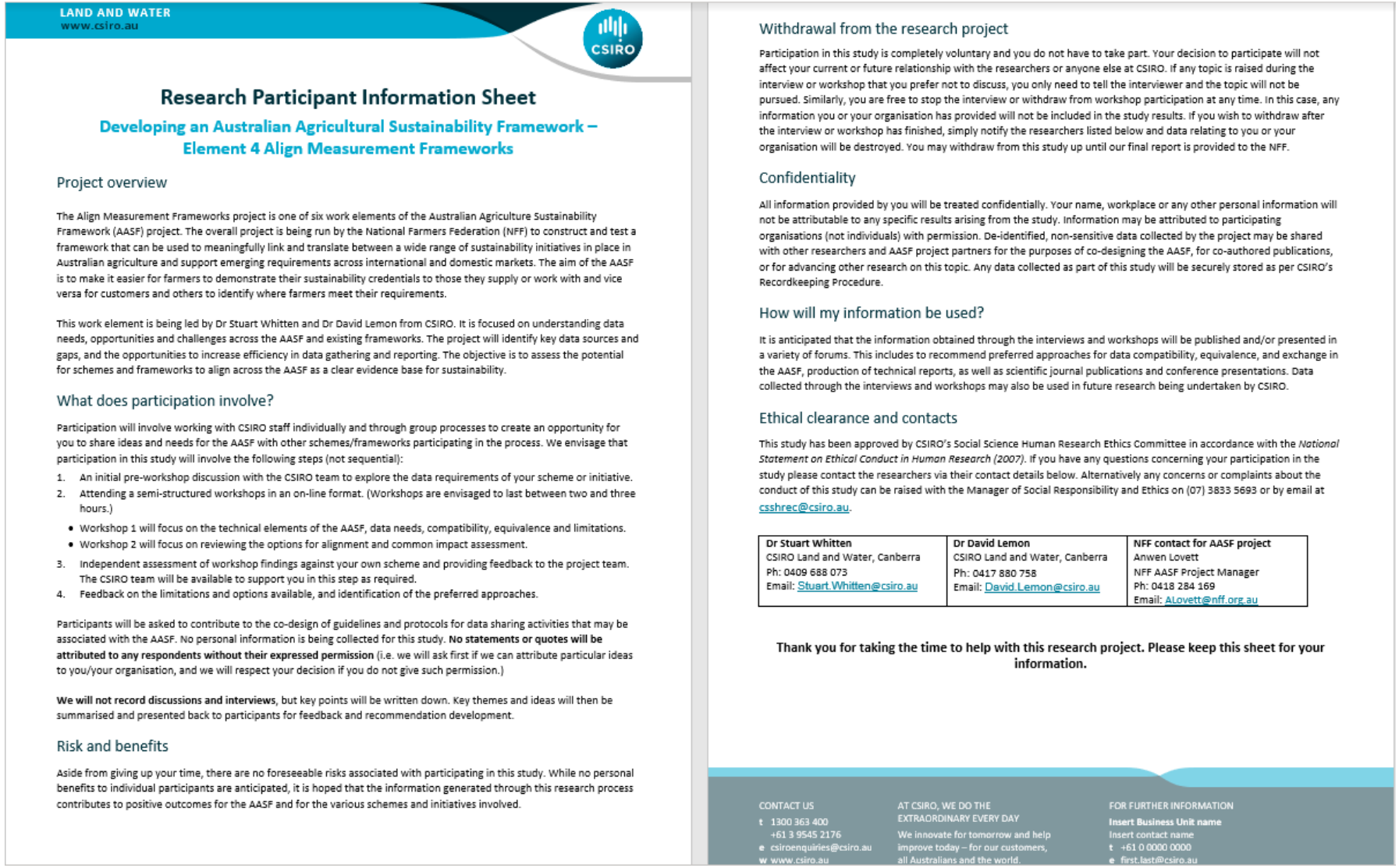
We understand that you have previously agreed to participate in this phase of the project and so are contacting you to organise **an interview of approximately thirty minutes to an hour** with you to discuss key data sources and gaps as well as the opportunities to increase efficiency in data gathering and reporting for use in AASF.

If you are **willing to participate**, please click on the link here to nominate a time and date for an interview, and one of our project team members will follow up with an online meeting link, additional background information on the project, research protocols and participant consent and privacy, together with a list of topics we plan to discuss with you. If you feel there are others in your organisation that we should be speaking to in additional to (or instead of) yourself, please let us know.

We look forward to hearing from you and thank you in advance for your assistance with this important project.

Please feel free to reach out to our team if you have any further questions.

A.2 Participant Information Sheet



LAND AND WATER
www.csiro.au

Research Participant Information Sheet

Developing an Australian Agricultural Sustainability Framework – Element 4 Align Measurement Frameworks

Project overview

The Align Measurement Frameworks project is one of six work elements of the Australian Agriculture Sustainability Framework (AASF) project. The overall project is being run by the National Farmers Federation (NFF) to construct and test a framework that can be used to meaningfully link and translate between a wide range of sustainability initiatives in place in Australian agriculture and support emerging requirements across international and domestic markets. The aim of the AASF is to make it easier for farmers to demonstrate their sustainability credentials to those they supply or work with and vice versa for customers and others to identify where farmers meet their requirements.

This work element is being led by Dr Stuart Whitten and Dr David Lemon from CSIRO. It is focused on understanding data needs, opportunities and challenges across the AASF and existing frameworks. The project will identify key data sources and gaps, and the opportunities to increase efficiency in data gathering and reporting. The objective is to assess the potential for schemes and frameworks to align across the AASF as a clear evidence base for sustainability.

What does participation involve?

Participation will involve working with CSIRO staff individually and through group processes to create an opportunity for you to share ideas and needs for the AASF with other schemes/frameworks participating in the process. We envisage that participation in this study will involve the following steps (not sequential):

1. An initial pre-workshop discussion with the CSIRO team to explore the data requirements of your scheme or initiative.
2. Attending a semi-structured workshops in an on-line format. (Workshops are envisaged to last between two and three hours.)
   - Workshop 1 will focus on the technical elements of the AASF, data needs, compatibility, equivalence and limitations.
   - Workshop 2 will focus on reviewing the options for alignment and common impact assessment.
3. Independent assessment of workshop findings against your own scheme and providing feedback to the project team. The CSIRO team will be available to support you in this step as required.
4. Feedback on the limitations and options available, and identification of the preferred approaches.

Participants will be asked to contribute to the co-design of guidelines and protocols for data sharing activities that may be associated with the AASF. No personal information is being collected for this study. **No statements or quotes will be attributed to any respondents without their expressed permission** (i.e. we will ask first if we can attribute particular ideas to you/your organisation, and we will respect your decision if you do not give such permission.)

We will not record discussions and interviews, but key points will be written down. Key themes and ideas will then be summarised and presented back to participants for feedback and recommendation development.

Risk and benefits

Aside from giving up your time, there are no foreseeable risks associated with participating in this study. While no personal benefits to individual participants are anticipated, it is hoped that the information generated through this research process contributes to positive outcomes for the AASF and for the various schemes and initiatives involved.

Withdrawal from the research project

Participation in this study is completely voluntary and you do not have to take part. Your decision to participate will not affect your current or future relationship with the researchers or anyone else at CSIRO. If any topic is raised during the interview or workshop that you prefer not to discuss, you only need to tell the interviewer and the topic will not be pursued. Similarly, you are free to stop the interview or withdraw from workshop participation at any time. In this case, any information you or your organisation has provided will not be included in the study results. If you wish to withdraw after the interview or workshop has finished, simply notify the researchers listed below and data relating to you or your organisation will be destroyed. You may withdraw from this study up until our final report is provided to the NFF.

Confidentiality

All information provided by you will be treated confidentially. Your name, workplace or any other personal information will not be attributable to any specific results arising from the study. Information may be attributed to participating organisations (not individuals) with permission. De-identified, non-sensitive data collected by the project may be shared with other researchers and AASF project partners for the purposes of co-designing the AASF, for co-authored publications, or for advancing other research on this topic. Any data collected as part of this study will be securely stored as per CSIRO's Recordkeeping Procedure.

How will my information be used?

It is anticipated that the information obtained through the interviews and workshops will be published and/or presented in a variety of forums. This includes to recommend preferred approaches for data compatibility, equivalence, and exchange in the AASF, production of technical reports, as well as scientific journal publications and conference presentations. Data collected through the interviews and workshops may also be used in future research being undertaken by CSIRO.

Ethical clearance and contacts

This study has been approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the *National Statement on Ethical Conduct in Human Research (2007)*. If you have any questions concerning your participation in the study please contact the researchers via their contact details below. Alternatively any concerns or complaints about the conduct of this study can be raised with the Manager of Social Responsibility and Ethics on (07) 3833 5693 or by email at csshrec@csiro.au.

Dr Stuart Whitten	**Dr David Lemon**	**NFF contact for AASF project**
CSIRO Land and Water, Canberra	CSIRO Land and Water, Canberra	Anwen Lovett
Ph: 0409 688 073	Ph: 0417 880 758	NFF AASF Project Manager
Email: Stuart.Whitten@csiro.au	Email: David.Lemon@csiro.au	Ph: 0418 284 169
		Email: ALovett@nff.org.au

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

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AT CSIRO, WE DO THE EXTRAORDINARY EVERY DAY
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FOR FURTHER INFORMATION
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Insert contact name
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e first.last@csiro.au

A.3 Interview Protocol

Pre-reading to send to participants when they have signed-up for an interview

1. *2-3 or three high-level questions for consideration before we meet*
    - *What data do you collect to support the functions of the [insert name of framework]?*
    - *Why do you collect these data?*
    - *Where do you collect these data from?*
    - *Is there room for improvement? How?*
2. *Participant information sheet (from ethics)*

Interviewees

Two Cohorts:

1. **Producer (Farm) side Frameworks and Schemes**
2. **Purchaser (Buyer) side Schemes**

High level goal. Explore the nature of the data collected to support the use of these frameworks and schemes. What is it, where does it come from, what is it used for, what obligations come with it, what challenges to do you have in collection, what would you like to see changed?

Interview Questions

1. Welcome (2-3 *minutes)*	***General introductions between project team and interviewee*** ***Participants informed of their participation rights – as described on the participant information sheet*** • "Before we begin, we'd like to confirm that you have read and understood the participant information sheet. This form provides confidentiality and privacy information on this project, and explains how identifiable information will be handled. Remember, you are free to withdraw at any time, and have your contribution removed from the project at your request prior to publication. Please remember we are collecting some forms of identifiable information for our report, and that we will seek your permission before using direct quotes or identifiable information (name and contact details). As part of our ethics approval, we must ask that you not to provide identifying information about someone else without their authorisation and not to provide sensitive information about yourself. **Are you willing to continue?**"
2. Context (2-3 minutes)	***Project Context*** • CSIRO has expertise in exploring and understanding data and information for the purpose of achieving interoperability between disparate systems. • This project will inform the development of the AASF which is being developed with funding from a grant to NFF from the

	Australian Government. The purpose of the AASF is to communicate the sustainability of Australian agriculture on an industry-wide scale to markets, consumers and financers. It is being designed to maintain Australian agriculture's reputation as a clean, green producer of quality food and fibre. It is a voluntary framework which aligns with existing schemes and does not seek to replace them • For this project, CSIRO is looking at the data currently collected to support the functions of a number of agricultural frameworks and certification schemes in use around Australia. • Our task is to map these data against the proposed Australian Agricultural Sustainability Framework (AASF) to identify opportunities for efficiencies in the collection of data as well as data gaps. This information will be used to further develop the AASF.` • This interview will help us to understand the data you collect as part of the *[insert framework name]*. Your input will play a critical role in helping design the AASF. **We will be taking notes as we go. Do you have any questions before we begin?**

3. Tell me about it
(20 minutes)
	Can you give us a brief overview of your background and role within (*insert interviewee's organisation here*)
	• Sustainability frameworks and schemes can be used for a number of purposes, can you please confirm what purpose of the *[insert framework name]* is? (What's the framework used for?)
	• How mature is *[insert framework name]?*
	• Can you talk about the data used to support measurement against the indicators in the *[insert framework name]*? In particular:
	  ○ What do you collect? Why? (If this is documented, are they willing to share the documentation?)
	  ○ How did you determine what to collect?
	  ○ Who do you collect it from? Are there other sources? How did you identify these sources? (Identifying the various sources of data)
	  ○ How often do you collect it?
	  ○ What obligations come with the data? (licences)
	
	• What are the major challenges/issues with data collection?
	• What works well with current method of data collection?
	• Have you ever been asked/approached to share the data you collect? What are the barriers to doing this?
	• If you could fix one thing in the data collection space, what would it be?

4. Tell me more (5-10 minutes)	**If necessary, a deeper analysis of the answers provided in pt.3 of the interview.** **Ask the interviewee to share anything we were not able to cover during the interview**
5. Priorities and playback (5 minutes)	**Project team member provides interviewee with a high-level synthesis and priorities of their conversation to be confirmed with the interviewee.**
6. Connect and Close (5 minutes)	**Final wrap-up. Project team member thanks the interviewee for their time and participation and provides contact information if they have any additional questions.** **Note that we are planning a workshop in the week of 15th November to bring all interviewees together, present what we've found and workshop solutions to identified challenges. Ask if they would be willing to participate.**

A.4 Interview notes verification

Dear <insert name>,

Thanks again for your interview with us about the AASF. Attached is a summary of our interview notes about the Marine Stewardship Council. This information will be used for our analysis of the data practices of the various schemes and frameworks we have interviewed. We would appreciate your response to let us know whether we have accurately captured our conversation and your situation. If you wish to provide comments, please provide a new version of the summary with your comments/tracked changes; otherwise, an email reply stating you are satisfied would be fantastic.

Many thanks,

Appendix B Framework/Scheme Summaries

B.1 Industry frameworks

Dairy Sustainability Framework

Type	Industry framework
Status	Existing – started in 2011/12
Purpose	The Dairy Sustainability Framework formed after companies were being increasingly asked to demonstrate their sustainability credentials. At the time, the focus was on environmental sustainability, there were no targets and the framework was more externally focused to provide assurance to markets, NGOs and dairy customers that they took sustainability seriously. Later, funding was received to set targets and indicators. These targets and indicators are based on economic prosperity, nutrition, animal welfare and natural resource management – following the industry's value chain from farm inputs through to farm production, manufacturing, retail and packaging, export and consumption. The framework is centred around 4 commitments: enhancing economic viability and livelihoods, improving the wellbeing of people, providing best care for all our animals, reducing environmental impact.
Data collection	Surveys: Data is collected at different periods –by calendar year, financial year and different frequencies (annually to 3 yearly). A third-party collects the data and DSF receives the data in aggregated form. Dairy farmer licence renewal. For VIC, it is once every 2 years; in other states, it is annual. Data sourced from govt agencies (e.g. Safe Work Australia)
Data sources	Land, Water, Carbon Survey (random survey)[8] • Soil and land management • Fertiliser use management • Farm effluent management • Managing land for conservation and biodiversity • Using renewable energy • Recycling and reuse activities Dairy Manufacturers Sustainability Council[9] • GHG emissions • Water use efficiency • Waste in supply chains AMRA Survey[10] • On-farm chemical use: chemical residue monitoring in milk Product Safety Recalls Australia[11] • Product recalls due to food contamination Dairy Trust Tracker Survey 2020 (online survey)

[8] Latest survey results from May 2020. Data included in the 2020 Land, Water, Carbon Survey Report is based on responses from 500 dairy farmers selected randomly from the Dairy Australia levy payer database who participated in a Computer Assisted Telephone Interview (CATI).

[9] DMSC (2021) Environmental scorecard 2019/20. Viewed 2 December 2021, https://www.sustainabledairyoz.com.au/reporting#.YagLFGBBxPY.

[10] https://www.awe.gov.au/biosecurity-trade/export/controlled-goods/dairy/links/australian-milk-residue-survey

[11] https://www.productsafety.gov.au/

	• Consumer perception on safety, quality and nutritiousness of milk • Consumer perception on animal welfare NHMRC[12] • Recommendation on dairy as a source of nutrition Genetics and Animal Husbandry Survey[13] (voluntary survey) • Animal health and wellbeing Safe Work Australia • Fatalities in workplace • Lost Time Injury Frequencies Rates DairyBase[14] • Profitability of business over time Dairy Workforce Survey (controlled survey)[15] • Employee livelihood In Focus 2020[16] • Value of payments to dairy farmers • Number of people employed in the dairy industry National Dairy Farmer Survey 2020 • Contribution to social capital • On-farm husbandry best practice University of Canberra Regional Wellbeing Survey (voluntary survey)[17] • Resilience and prosperity of dairy communities
Other comments	There are no sustainability certification schemes in the dairy industry in Australia.
Our data sources	Interview 2020 Sustainability Report[18]

[12] https://www.nhmrc.gov.au/

[13] Latest data is from 2019 sustainability report. More information at https://www.sustainabledairyoz.com.au/best-care-for-animals#.YalN62BBxPY.

[14] an online tool enabling dairy farmers and their advisors to measure and compare farm business performance over time. Available at: https://www.dairyaustralia.com.au/western-dairy/farm-business/dairybase#.YalMT2BBxPY.

[15] Dairy Australia (2021) Workforce: The power of people on Australian dairy farms in 2020. Viewed 3 December 2021, https://thepeopleindairy.org.au/wp-content/uploads/2021/08/3353-Workforce-The-Power-of-People-on-Aust-Dairy-Farms-2020.pdf. An independent survey of around 400 dairy farmers was conducted in 2014,2017 and 2020. Commissioned by Dairy Australia

[16] Dairy Australia (2021) In Focus 2021. Viewed 2 December 2021, https://www.dairyaustralia.com.au/industry-statistics/industry-reports/australian-dairy-industry-in-focus#.YagIUmBBxPY.

[17] https://www.canberra.edu.au/research/institutes/health-research-institute/regional-wellbeing-survey

[18] Australian Dairy Industry Sustainability Report 2020. Viewed 3 December 2021, https://www.sustainabledairyoz.com.au/reporting#.YalmamBBxPY.

MLA managed Sustainability Framework

Type	Industry framework
Status	Existing
Purpose	To report and promote industry performance against agreed set of sustainability indicators. Progress and performance are communicated via an annual 'report card' called the Australian Beef Sustainability Annual Update. This report outlines projects and priorities MLA has committed to.
Data collection	Data collected is external and internal, mix of market, industry, compliance and on-farm and other data. Data collection is a relatively manual task undertaken by the individual frameworks. Essentially, each framework identifies and tracks down that data needed from the various sources. Data is collected and stored in MLA Marketing & Insights & integrity Systems Company[19].See ABSF for further detail. Data are used to produce the annual sustainability reports.

Data sources	• Integrity Agriculture: works closely with National Greenhouse Gas Inventory
	• Cibo Labs: provides data for Balance of Grass and Tree Cover dashboard[20]
	• ABS, ABARES, DAWE, AAWCS, NFAS
	• Data collected by MLA and held within MLA's Marketing & Insights & Integrity Systems Company
	• Some specific sources:
	  ○ NLIS – mandatory
	  ○ LPA producer assurance program – mandatory for certain markets
	  ○ National Vendor declaration system – not mandatory for sheep at this stage.
	• Biosecurity regulations require traceability of animals through the supply chain. Every producer has a producer identification code, which is mandatory. Animals are tracked from purchase to sale. Many systems are mandatory to be able to support different markets, such as export markets.

Other comments	
Our data sources	Interview ABSF Sustainability Report 2021[21]

[19] https://www.integritysystems.com.au/

[20] https://www.sustainableaustralianbeef.com.au/resources/botgc-dashboard/

[21] https://www.sustainableaustralianbeef.com.au/globalassets/beef-sustainability/documents/bh.03_australian-beef-sustainability-annual-summary-v5.pdf

Australian Beef Sustainability Framework

Type	Industry framework
Status	Existing – established in 2017
Purpose	The framework was developed in response to questions and concerns by the industry. Primary audience is customers, investors, consumers and special interest groups. The framework does not offer accreditation. Rather, it is a way to communicate how the industry is performing and improving in priority areas and how they are focused on continuous improvement.
Data collection	Data is collected around the 4 themes of the framework: animal welfare, economic resilience, environmental stewardship, people & the community. Across these themes are 24 priorities and a total of 49 indicators. Not all are measured and they are currently being reviewed. Manual and time consuming. Involves phone calls and emails to network to obtain data. For the data availability, an external consultant is employed who collects and analyses data. Data is also verified to see how reliable it is. Report provided by the external consultant is in progress and will potentially be available by the end of the year. Data on materiality assessment based on one-on-one interviews with stakeholders, industry workshops, open survey asking people to rank their thoughts and opinions. Some data comes from voluntary surveys and self reporting.
Data sources	There are about 25-40 data sources for the framework's indicators. These are all listed in the ABSF report. They include: • CIBOLabs – spatial analysis for tree and veg cover • Australian Meat processing corporation – data for the beef report • Meal and Livestock Australia – data for the beef report • Contracts CSIRO to do carbon neutral assessments and spatial analysis. Typically these are annual but dependent on funding cycles. • Auditing companies • Integrity systems – traceability data for livestock. Is a subsidiary of MLA. • ABS Farm Census • ABARES Farm Survey
Other comments	MLA recognises the need to move away from surveys and self-reporting as data sources. Strong desire to reuse/repurpose existing data rather than create additional work for farmers. There is a lot of goodwill in the industry due to the relationships formed. Industry spend does not equal outcomes.
Our data sources	Interview with ABSF and MLA ABSF Sustainability Report 2021

PLANET. PEOPLE. PADDOCK

Type	Industry framework		
Status	In development – started in 2020 and currently seeking stakeholder advice on 2024-2029 sustainability targets		
Purpose	PLANET. PEOPLE. PADDOCK is Cotton Australia's sustainability framework targeted at on-farm cotton production. It is not a compulsory standard. The framework contains 8 topics as being most important to cotton growers and stakeholders inside and outside the industry: water, carbon, biodiversity, pesticides (PLANET); quality of work life, wellbeing & social capital (PEOPLE); efficiency, profitability (PADDOCK). PLANET. PEOPLE. PADDOCK aims to increase value by reducing risk, increasing productivity and growing markets through evidence of sustainability performance.		
Data collection	Initial indicators were set in 2014 and then targets prior to the 2019 report. Progress is reported every 5 years. Data for PLANET. PEOPLE. PADDOCK is collected from a range of external sources against the defined targets of the framework on a 5 yearly basis. Some data on public perception of the industry is collected.		
Data sources	Water • 2017-2018 Water Productivity Benchmarking study (NSW DPI)[22] Biodiversity • 2017-2019 Cotton Grower Survey[23] Carbon • 2019 carbon footprint study[24] • Rolling 5-year average of CRDC Cotton Grower Survey[25]	Quality of work life • ABS Census data (2011 and 2016) • Commissioned research by AgHealth Australia[26] Wellbeing and social capital • 2016 ABS Agricultural Census • University of Canberra's Regional Wellbeing Survey 2018 • Cotton Australia annual report	Efficiency • Cotton Australia: 5-year average of Australian Cotton Production Forecasts (Cotton Australia) Profitability • Rolling 5-year average of Australian Cotton Comparative Analysis[27] Pesticides • CRDC commissioned research[28]
Other comments	Soil health – difficult to measure accurately and meaningfully; however, they are assessing feasibility of using cotton farmers' visual soil assessment (based on FAO's Visual Soil Assessment guide) as an indicator		
Our data sources	Interview 2020 Fact sheet[29] Stakeholder consultation paper[30] Australian Cotton Sustainability Report 2019[31]		

[22] NSW DPI (2019) Benchmarking water productivity of Australian irrigated cotton. Viewed 30 November 2021, https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/1185288/Benchmarking-Water-Productivity-of-Australian-Cotton.pdf.

[23] CRDC 2020 Cotton Grower Survey. Viewed 30 November 2021, https://www.crdc.com.au/publications/cotton-grower-survey.

[24] Visser F (2020) Carbon footprint of Australian irrigated cotton 2019. Viewed 30 November 2021, http://www.insidecotton.com/xmlui/handle/1/4768?show=full.

[25] https://www.crdc.com.au/publications/cotton-grower-survey

[26] Lower T and Peachey K-L (2019) Sentinel health and safety data for Australian cotton farms. Viewed 30 November 2021, http://hdl.handle.net/1/4765.

[27] CRDC (2019) 2018 Australian Cotton Comparative Analysis. Viewed 30 November 2021, http://hdl.handle.net/1/4688.

[28] Rose M (2020) Environmental toxic load for Australian Cotton 2000-2018. Viewed 30 November 2021, http://hdl.handle.net/1/4769.

[29]https://www.crdc.com.au/sites/default/files/pdf/PLANET.%20PEOPLE.%20PADDOCK.%20sustainability%20fact%20sheet.pdf

[30] https://cottonaustralia.com.au/assets/general/Publications/Sustainability-Reports/Sustainability-stakeholder-consultation-paper-v4.pdf

[31] https://www.crdc.com.au/publications/australian-cotton-sustainability-report

Australian Egg Industry Sustainability Framework

Type	Industry framework
Status	Existing – since 2018
Purpose	To provide a process for public engagement and build community trust for the egg farming industry. To help demonstrate that the egg industry is committed to addressing issues of public interest and concern.
Data collection	The only data collected for the framework are annual measures of priority issues for the public in connection with the egg industry and public perception of the egg industry's response to those issues. This data collection is undertaken by a 3rd party provider: VoconiQ (a CSIRO spin-out company). Data is collected via an annual public survey. About 5000 people are surveyed. Data is not formally provided to the Australian Eggs Corporation. CSIRO conducted a community survey process in 2021 to understand community attitudes and identify pathways for building community trust. Only survey data is used to determine public priority issues in connection with the egg industry and public perception. Case studies are used to determine whether change has occurred. Data is not collected about farmers.
Data sources	Community The content of the 2021 survey[32] included: • measures of participant demographic characteristics • background knowledge of the egg industry • the lives of people internal and external to the egg industry • animal welfare • environmental impact • economic viability • governance and regulation • COVID-19, including food security and traceability • trust and acceptance of the egg industry in Australia.
Other comments	Does not anticipate a need to collect sustainability data in future as public confidence is derived from consultation - listening to community, identifying priorities and showing you are responding. Australian Eggs understands they operate differently to other frameworks and schemes, but they are happy with the results their framework provides. Believes it is important to understand what the audience wants before proceeding with the expensive effort of collecting data. Export industries cannot be successful in overseas markets if they don't have domestic support. Believes Egg industry has good experience with good domestic stories. Australian Eggs provides a sustainability dashboard to egg producers. It is a self-assessment tool that is mainly used by small to medium farmers. It asks about 20 questions. The answers to the questions give producers a sense of how they are faring with sustainability. It is not intended as a benchmark against peers. Australian Eggs does not collect data from the sustainability dashboard. However, they have received positive anecdotal feedback about the dashboard. Producers must meet the requirements of Egg Standards of Australia to be accredited. However no data is gathered for this process. Australian Eggs is the scheme owner, which is called Egg Standards Australia. Accreditation is conducted by a third party (AusMeat) and usually only larger farmers obtain accreditation.
Our data	Interview Sustainability Framework Report 2021[33] VoconiQ community research report[34]

[32] VoconiQ (2021) Australian egg industry community research report 2021. Viewed 1 December 2021, https://www.australianeggs.org.au/assets/Sustainability-Framework-Community-Survey-Report-2021-v2.pdf

[33] https://www.australianeggs.org.au/what-we-do/sustainable-production/sustainability-report

[34] https://www.australianeggs.org.au/assets/Sustainability-Framework-Community-Survey-Report-2021-v2.pdf

Behind Australian Grain

Type	Industry framework
Status	In development
Purpose	The purpose of the framework[35] will be to report at a national level on sustainability priorities agreed upon by the grain industry.
Data collection	Data will be used to report to the industry. Publicly sourced data. Proposed data to collect for framework are: • Soil health • Conservation • Carbon footprint • Water use efficiency • Chemical use • Biosecurity • Worker safety • Capacity & Leadership • Food safety • Responding to consumer needs • Innovation • Trust & Awareness
Data sources	Data are expected to mainly come from ABS, ABARES, GRDC and GRDC's annual grower survey.
Other comments	The framework will be based on learnings from Beef, Sheep and Cotton. It is likely to be most similar to Cotton.
Our data	Interview

[35] https://www.behindaustraliangrain.com.au/

Rice Growers Promise

Type	Industry framework
Status	In development – developers are SunRice, along with Murray Local Land Services and the Ricegrowers' Association of Australia, and 21 Riverina rice growers. Currently in pilot phase.
Purpose	The framework is being developed to align with the international Sustainable Rice Platform as well as local frameworks. It is intended to serve 3 purposes: 1. support marketing of rice, in particular with respect to accessing premium markets where they exist 2. tell the Australian rice farmer story 3. support programs to improve grower practices.
Data collection	• Data is collected from growers. At present this is done by annual survey (100 of 400 growers). In future, will move to online system and target grower group meetings to capture data. • Data is collected at the grower level and individual variety of crop the grower is growing. Also have it down to farm to individual paddock level. • Actual data collection is undertaken by SunRice and shared with the RiceGrowers Association for the sustainability work. • A GIS system/data reporting system is currently in development. In future, data will be recorded largely through GIS system and other specific questions – trying to bring the two together. GIS data extracted via Excel reports. Data collected will be used for research and promoting continuous improvement for both sustainability side and productivity aspect of rice farmers. Data will be collected under 3 pillars: • Innovation: Key priorities are soil health, carbon footprint, water use, crop inputs • Quality: Key priorities are focus on quality, consumer engagement, traceability • Community: Key priorities are biodiversity, people & talent, building a legacy
Data sources	• Most data is collected from the growers themselves • Some data (water use) is sourced from irrigation supply companies
Other comments	The framework recognises they need to improve their data collection systems to improve experience for farmers. The framework will recognise that rice growers grow other commodities and will align key priorities and goals to other commodity frameworks. SunRice have their own sustainability report from supplier to market. This is a separate project to the framework.
Our data	Interview Rice Sustainability Framework website[36]

[36] https://www.rga.org.au/Public/Content/The_Rice_Industry/Rice-and-the-environment/Rice_Sustainability_Framework.aspx

B.2 Industry certification schemes

myBMP	
Type	Industry certification scheme
Status	Existing - The original BMP program began in 1997 and was reviewed and redeveloped in 2006-07 with the new online 'myBMP' system re-launched in 2010.
Purpose	myBMP[37] is a certification standard. Its purpose is to influence on-farm practice to meet legal requirements and industry best management practices and reduce risk. myBMP comprises 10 modules in which farmers can self-assess their compliance and provide evidence to support compliance. The questions in the module are Yes/No. After completing the modules, farmers can request accreditation through a third-party auditor. The rationale for modules (which to include) comes from legal requirements as well as supporting shift to best practice methods and approaches. Essentially modules cover those aspects that are important to maintain the industry. This is a voluntary framework. Approximately 10% of cotton growers are myBMP certified.
Data collection	Data from myBMP is not collected nor used. There is a desire to make myBMP more suitable for data collection. myBMP comprises 10 modules in which farmers self-assess their compliance and provide evidence to support compliance. The modules cover: • HR & WHS • Integrated Pest Management • Fibre Quality • Energy and Input Efficiency • Biosecurity • Water Management • Soil Health • Sustainable Natural Landscape • Petrochemical Storage and Handling • Pesticide Management All questions in each module are 'Yes/No' type. After completing all 10 modules, growers can request an audit which is undertaken by a third party. The auditor reviews 5 compulsory modules and one other (randomly selected). Once the third-party auditor is satisfied all checklist items have been complied with and makes a recommendation for certification, the grower is certified. The certification is for 5 years. After 2 years, farmers are eligible to be in the pool for random audits (to ensure farmers are continuing to maintain compliance).
Data sources	Cotton growers
Other comments	myBMP does not have a discrete module on climate change or human labour. There is a range of other things in the sustainability report that is not being captured in myBMP.
Our data	Interview myBMP module

[37] https://www.mybmp.com.au/

Sustainable Winegrowing Australia

Type	Industry certification scheme
Status	Existing – operating since 2009 but in other forms
Purpose	The goal of the scheme is to increase participation by grapegrowers and winemakers in sustainable practices. The framework is a mechanism to provide resourcing for reporting and data collection as well as to provide a pathway for market access. The scheme is administered by AWRI, with governance, endorsement and active support from Australian Grape & Wine and Wine Australia. It is Australia's national program for grapegrowers and winemakers. The scheme offers two types of membership: Members and Certified Members. Certification is voluntary and is conducted by **FreshCare** (third-party standards organisation). Members can self-assess to get a rating, which shows how they compare to their region and nationally. Ratings comprise 0 to 4. A rating of 3 indicates best practice and means that members are eligible for certification. Those seeking certification will be audited. There is no industry set standard that defines best practice. Best practice is considered to be what is commonly well-accepted in the industry.
Data collection	Reporting is done annually through a self-assessment for members and a third-party audit for certified members. When a member is certified an independent audit is done every 3 years to continue the certification. Data comprise numbers, yes/no answers, or free text. Data collected are: • Production metrics: (size of vineyard, yield), environmental, water, energy to supply irrigation, volume, electricity (grid and renewables) – and are their members doing renewables on site, petrol/biodiesel, waste, number of contractors • Contractors – are they used, how much, emissions • Fertilisers: how many kilos of synthetic and organic nitrogen, also urea • Biodiversity: area of land members have on their property dedicated to enhance biodiversity. Participation in local community biodiversity projects • Economics – farm income. Highest, lowest, average price per tonne • Total vineyard revenue, operating costs – off farm income, return on sales, operating costs (most will not provide this info) • Agrichemicals – have they been applied according to recommendations/regulations • Electronic spray diaries • Additional for wineries: volume for wastewater and how they are treating wastewater. Winemaking CO2 (purchase CO2), synthetic For self-assessment, an overall rating is provided from 0 (not doing anything) to 4 (demonstrating best practice and continuous improvement strategies are in place). A benchmarking report is generated from the data. Members get a rating on their performance. **Certification by Freshcare** Freshcare – Standard of Sustainable Practice Viticulture Edition 1. Certification to the Freshcare Australian Wine Industry Standard of Sustainable Practice – Viticulture can be used to meet the requirements of Sustainable Winegrowing Australia • Management: Sustainability Action Planning; • Environmental: Biosecurity; Land, Soil and Nutrient Management; Pest and Disease Management; Water; Biodiversity; Waste; Air Quality; Energy and Fuel Freshcare – Standard of Sustainable Practice Winery Edition 1. Certification ot the Freshcare Australian Wine Industry Stndard of Sustainable Practice. • Environmental: Biosecurity; Chemical Management; Emergency Response; Water Management; Wastewater Management; Biodiversity; Waste; Air Quality; Energy and Fuel
Data sources	Data are collected from growers and wineries. No data are collected from other sources, but remote sensing is being explored.
Other comments	The scheme is thinking about how to benchmark this program against the EU and other international frameworks. They haven't done the work yet, but know it is coming.
Our data	Interview

Hort360

Type	Industry certification scheme
Status	Existing – since 2008
Purpose	Hort360 is a tool to document and benchmark management practices across primarily horticultural producers. The ultimate purpose to drive an increase in the number of producers implementing industry 'best practice'. Most Hort360 users are based in QLD, with some national users. The program is entirely voluntary. Hort360 allows growers to transition to a third-party audited process and enable Freshcare Environmental Certification. After questions have been completed, an assessment report is generated with scores and actions to take to improve score. Growers can see how they are performing over time as well as compare their progress to other growers. Completion of Hort360 allows growers to access accredition through a third-party auditor for reshcare Environmental certification or hort360 Reef Certification.
Data collection	Each module contains a set of questions. Each question results in a score (1-4). To complete Hort360, growers can either engage with facilitators to assist them or they can self-assess. They can also do both. The questions in the module cover: • Irrigation • Waste • Pesticide • Biosecurity • Energy • Biodiversity • Workplace safety • Soil • Climate • Runoff • Air • Better business • Nutrient Farm data: Growers are given guidance on how to answer. The answers are converted to a score which relates to risk (on a scale of 1-4). Data is reported at multiple levels. Collated data is provided annually to Qld Dept. Environment and Science to articulate management practice relating to water quality (Great Barrier Reef and Moreton Bay). Currently have a couple of projects which Hort360 data will feed into • Hort Innovation Australia – Horticulture Sustainability Framework development, Digital Smart Farms • QLD Dept of Ag and Fisheries – Farm Business Resilience Program The data from the module is used to help identify any research, development and extension, product development and training needs.
Data sources	• Farmers' input into Hort360 module • Third-party auditor for Freshcare Environmental certification • Third party audit for Hort360 Reef Certification
Other comments	• International markets – data is not used for that right now but potential opportunity in future. • Having facilitators involved in guiding growers through Hort360 works really well.
Our data	Interview Hort360 website[38]

[38] https://www.hort360.com.au/

B.3 Third-party certification schemes

Australian National University	**Australian Farm Biodiversity Certification Scheme**
Type	Third-party certification scheme
Status	In development - The scheme is still in design phase, with trials to occur over the coming months to early next year.
Purpose	To provide farmers with the opportunity to be certified as biodiversity friendly. The scheme will assess condition of biodiversity on farms, based on a farm score. If farm score is above regional average and the region is above a national benchmark, then farms are candidates for certification. It will be a voluntary scheme. Certification levels: • Gold - farm has reached requirement for certification and the owner is committed to further improving condition of biodiversity • Green - farm has reached requirement for certification and the owner is maintaining the condition of biodiversity • Provisional - farm has **NOT** reached requirement for certification but is close. The owner is committed to further improving condition of biodiversity to reach required standard. The methods of the scheme try to assess how much natural landscape is left. It recognises that native pastures have the potential to maintain levels biodiversity however, farms that are 'wall-to-wall' cultivation will struggle. The scheme also wants to celebrate farms that have kept native vegetation but does not want to criticise.

Data collection	Data is collected through publicly available, creative commons datasets. However, HCAS data comes with obligations. These are viewed as the most authoritative data sources. Data is not 100% perfect, but it is the best available at the moment. Agreements are in place to collect HCAS data. The data collected are:
	• Vegetation data: remotely sensed data based on existing datasets
	• Landuse mapping from states
	• Landcover classification (GA) – updated annually
	• National environmental accounts
	• Native vegetation extent data (NVIS – DAWE) – states update with varying regularity
	• Condition data:
	  ○ HCAS (Williams and Ferrier (CSIRO)) - frequency is less clear but data reported over a long timeframe (last data reported for 2001-2018)
	  ○ Published condition data from states
	• Land capability mapping: from states
	• Landuse: cultivated, cropping
	The scheme recognises there are limitations to this data, which is why the data is always complemented by a site assessment to provide a better picture.
	Data inputs are updated every 3 years.
	Farmers do not need to provide data. The hope is to start to collect data and develop a management plan. Re-certification 3 years later, the existing process will be followed again – no expectation for farmers to maintain data. Thus, data inputs are updated every 3 years.
	The primary use for this data is to support the certification process.

Data sources	Publicly available, creative commons datasets. CSIRO[39], GA[40], NVIS - DAWE[41]
Other comments	None
Our data	Interview

[39] A habitat condition assessment system for Australia https://research.csiro.au/biodiversity-knowledge/projects/hcas/

[40] National Land Cover Dataset https://www.ga.gov.au/scientific-topics/earth-obs/accessing-satellite-imagery/landcover

[41] Native Vegetation Information System (NVIS) https://www.awe.gov.au/agriculture-land/land/native-vegetation/national-vegetation-information-system

Accounting for Nature

Type	Third-party certification scheme
Status	Existing – since 2008. From 2008 to 2018, developed by Wentworth Group of Concerned Scientists. Since 2018, development and application of model now implemented by AfN Ltd.
Purpose	The vision for Accounting for Nature is to become a global leader for measuring change in the health of the environment. Accounting for Nature is a certification body, using credible science as the basis for its environmental accounts. It is a framework that is used to measure the biophysical condition of environmental assets (e.g. native vegetation, soils, freshwater, native fauna, marine) at 3 different scales: project, property and region.Certification can either be conducted through a third-party audit or self-verification using a standardised checklist. The intent of Accounting for Nature is to provide flexibility around the certification process to acknowledge the varying market drivers. Farmers/landholders can select the type of method they wish to use, which will dictate the level of confidence.
Data collection	Data is collected by the proponent to build an environmental account. Environmental accounts measure and track the condition of soil, native vegetation, native fauna, freshwater, marin and carbon using an environmental index - the Environmental Condition Index (Econd), which is used to measure changes in environmental condition over time. There are three levels of confidence, which range from Level 1 (95% confidence; uses state-based methods) to Level 3 (80% accuracy; uses photos). The method chosen by the proponent will dictate the type of data collected; however, it is the confidence that determines the nature of the data. If there is not a method suitable for what the proponents want, they can develop their own and put to standards committee for sign off. Accounts are generated at least every 5 years, however, can be done more frequently if information is required. The same indicators are measured as per the previous account. Depending on certification data can be collected through: • Third-party audits • Self-assessment – photos; soil can be sent to lab for analysis Data are stored centrally. If data are made publicly available, they are de-identified and aggregated according to their legal advice.
Data sources	• Publicly available data (e.g. NVIS, remote sensing) • On-farm
Other comments	Biodiversity can be a lot of things and it depends on what is material to the farmer (e.g. koalas may be relevant on one property but not on another). We should measure what is material and needs to be tied back to the claim you are making, tied back to a purpose.
Our data	Interview Account for Nature Certification Standard[42]

[42] Accounting for Nature Certification Standard Version 3.0 Consultation draft. Viewed 6 December 2021, https://static1.squarespace.com/static/5dc38cde1d028031235ca3cf/t/61a569c0ef4c07476c33cf2d/1638230475988/211130+AfN+Standard+V3.pdf .

LA TROBE UNIVERSITY Farm-scale Natural Capital Accounting

Type	Third-party certification scheme
Status	Existing – since 2008
Purpose	Accounting for Nature started in 2008 by the Wentworth Group of Concerned Scientists. It is an environmental condition accounting framework aligned with the UN SEEA-EA and various other overseas initiatives. Although there has been much advocacy in the past for it to be rolled out through NRMs, a decision was made for it to be not-for-profit and build it from the ground up. Accounting for Nature is a certification body, using credible science as the basis for its environmental accounts. There are three levels of confidence, which range from Level 1 (95% confidence; uses state-based methods) to Level 3 (80% accuracy; uses photos) The intent of Accounting for Nature is to provide flexibility around the certification process to acknowledge the varying market drivers. Farmers/landholders can select the type of method they wish to use, which will dictate the level of confidence. The framework measures the biophysical condition of environmental assets (e.g. native vegetation, soils, freshwater, native fauna, marine) at project, property or region, state or country level.
Data collection	Certification can either be conducted through a third-party audit or self-verification using a standardised checklist. The method chosen by the proponent will dictate the type of data collected; however, it is the confidence that determines the nature of the data. If there is not a method suitable for what the proponents want, they can develop their own and put to standards committee for sign off. Accounts are generated at least every 5 years, however, can be done more frequently if information is required. The same indicators are measured as per the previous account. Environmental accounts measure and track the condition of soil, native vegetation, native fauna, freshwater, marine and carbon using an environmental index (Econd). An Econd is valued between 0 and 100, where the reference condition is 100, and this value can be tracked over time and compared to the reference condition to determine changes in environmental condition. Optional is a Production Condition index (Pcond) for soil or vegetation, which describes the potential of the biophysical asset relative to its condition to produce a defined set of goods or services.
Data sources	• Publicly available data (e.g. NVIS, remote sensing) • On-farm
Other comments	Biodiversity can be a lot of things and it depends on what is material to the farmer (e.g. koalas may be relevant on one property but not on another). We should measure what is material and needs to be tied back to the claim you are making, tied back to a purpose.
Our data	Interview Accounting for Nature website[43] Account for Nature Certification Standard (version 3.0 Consultation draft)[44]

[43] https://www.accountingfornature.org/

[44] https://static1.squarespace.com/static/5dc38cde1d028031235ca3cf/t/61b156f2181d814a332955ca/1639012094645/211209+AfN+Standard+V3.pdf

Marine Stewardship Council

Type	Third-party certification scheme
Status	Existing – since 1999
Purpose	Marine Stewardship Council (MSC) is an international voluntary sustainability standard covering wild catch fisheries. It has been independent since 1999 and is not for profit. The scheme rewards sustainable fishing practices, and there has been a recent addition of social expectations (e.g. forced labour, child labour, modern slavery, etc). There is an understanding that markets reward fisheries for adhering to standard as well as market-based initiative to drive change at sea. MSC offers three standards: • MSC Fisheries Standard – assess a fishery is well-managed and sustainable • MSC Chain of Custody – ensures products are traceable and separated from non-certified products • ASC-MSC Seaweed Standard – promotes sustainable and responsible use of seaweed
Data collection	The Fisheries Standard assesses: sustainable fish stocks, environmental impact, and fisheries management. The scheme comprises 3 principles, 9 components, 28 performance indicators (scored at 60, 80, 100 level), 89 scoring issues. Answers to performance indicators based on scores '60, '80' or '100'. Scheme data is collected by independent (3rd party) assessors (certifiers). The certifier has a set of questions and then scores the client on each of those questions. There is also a confidence level applied. If there are issues with confidence, there may be a conditional certification issued which stipulates more data be collected to support performance and best practice. Certifiers provide an initial draft report on fishery performance based on questions. This report is published on their website which then triggers stakeholder consultation. Data is used for the certification report. (which is made publicly available). The MSC website hosts data and analyses this data for trends to test if best practice is being followed.
Data sources	MSC does not collect data *per se*. Bodies seeking certification provide data to the certifier to support the application. This is not transferred to MSC.
Other comments	None
Our data	Interview MSC website[45]

[45] https://www.msc.org/standards-and-certification/the-msc-standards

B.4 Supply chain corporations

Tyson Foods Australia	
Type	Supply chain corporation
Status	Existing
Sustainability Focus	Tyson is the world's second largest meat company – processing approximately 155,000 cattle a week – and the largest chicken producer in the world. It is a predominantly US-based company. Grew significantly to Asia in 2018. In Australia, business is to take beef and make into hamburgers and other value-added products – about 100 tonnes of beef per day. McD's is about 90% of their business. For Tyson, most action around sustainability prior to 2020 has been reactive but there is increased effort by NGOs and public affairs organisations to elevate food systems towards environmental sustainability goals. Corporate goals: • Deforestation commitment –end deforestation by 2030 for all supply chains; by 2025 for Australian beef. • Science-based target[46] for climate – 30% reduction by 2030. Science-based target is an initiative set up by NGOs and research organisations where they develop a target and prove that they were achieving reduction by 2%. • A number of smaller plant-based targets, not relevant to agriculture as they are post-farm gate.
Data collection	Suppliers to Tyson in Australia are meat processors/abattoirs. Fulton Market Group supplies meat for McDonald's burgers Tyson Foods Australia is still in the process of collecting data. The industry framework (ABSF) is important to Tyson Foods Australia as Tyson do not have traceability data for much of their meat. Sustainability data is not yet collected. Main focus has been on verification of plants but there is interest – particularly in animal welfare. Postcode data for the source of meat is collected where possible to help with deforestation targets.
Data sources	FMG – supplies data about the product. Climate data in Australia: NCAS (National Centre for Atmospheric Science); however, there are no emissions factor data at regional scale. Tyson Foods Australia is reliant on industry-level data. Deforestation data is the exception. Deforestation data are postcode-based. Tyson Foods has a spatial mapping tool (developed by AgriFoods) that can verify deforestation by postcode. They use guidance from the ABSF to define deforestation. Water footprint – work is being done with the Water Resources Institute around water risk (volume of water used per volume of beef).
Other comments	There is a sustainability report[47] based on US operations.
Our data	Interview

[46] Targets use scientific rigour and then are approved by the Science Based Targets Initiative (SBTI) (guidance on accounting rules). SBTI is the most rigourous check of climate targets – it is new in Australia. (https://sciencebasedtargets.org/).

[47] https://www.tysonsustainability.com/downloads/Tyson_2019_Sustainability_Report.pdf

SunRice

Type	Supply chain corporation
Status	Existing
Sustainability Focus	SunRice collects sustainability related data to be used to support their sustainability credentials: • SunRice is committed to net zero emissions by 2050. • Being able to defend social licence to grow rice (e.g. litres of water per kilo of rice) in Australia. SunRice has implemented systems that give them a spatial view of location of rice and details about when, how, etc. the rice was planted. They strive to have every rice planting mapped in Vic, southern NSW and northern QLD. Essentially, the logistics around rice planting are recorded on location and type of rice. Originally SunRice was set up as a cooperative – still grower controlled – working on adding value to data and provide value to growers for growers who supply data. SunRice is working to develop a rice sustainability framework along with Murray Local Land Services and the Ricegrowers' Association of Australia. The framework is called Rice Growers Promise.[48]
Data collection	Sustainability reporting is undertaken at an industry level. On the growing side, there are 5 areas of interest: • cultivation • planting • chemical • nutrient • irrigation. Harvest data: • yields and • grain quality data. Data down to farm and variety level. Remnant vegetation data is not collected. Data collected by growers or their agronomists via farm management records or diaries on farm mapping and chemical application. Data collection is voluntary but is ultimately a requirement as part of rice collection. On-farm data is part of quality assurance for SunRice to collect rice from farms.
Data sources	Primarily from growers via farm management records or diaries. SunRice is looking for remote sensing solutions around water use, crop being flushed, location of rice. They are also investigating digital agronomy conditions and forecasting methods to provide to growers as value adds.
Other comments	Businesses SunRice supplies to are beginning to ask for sustainability data (eg. Kellogs) – particularly around emissions data, water use efficiency and right to farm. These businesses want assurance that rice growers are sustainable. SunRice does not want sustainability to just equal environment. You've got to look at the whole picture including communities and economic sustainability. In terms of branding around sustainability, it is not clear to their customers what 'sustainably grown' means. SunRice is investigating traceability of their products through the KPMG Origins Blockchain Pilot Program.
Our data	Interview

[48] https://www.rga.org.au/Public/Content/The_Rice_Industry/Rice-and-the-environment/Rice_Sustainability_Framework.aspx

Fonterra

Type	Supply chain corporation
Status	Existing
Sustainability Focus	Fonterra does not have a sustainability framework *per se*. Fonterra is a founding and implementing member of the Dairy Sustainability Framework.
Data collection	The dairy industry is data rich with data being collected from farms on a daily basis. This data collection originally started in the area of food safety and has evolved to include quality, environmental and social/ethical aspects. Fonterra is specifically interested in: • Data about the product (food safety, quality, etc) – collected daily • Data associated with the farm's licence requirements (ensuring the farm is licensed) – collected every few years Data is collected at different timeframes: • Daily data – Very transactional data: how much, quality, where it goes. Did it meet the spec? (Spec refers to: temperature, cell count, protein content, fat content, age (time milked vs time picked up)) • Lower frequency data – farm records on animal health, animal welfare, etc. These data are often paper-based although looking to move to electronic. • Intervention data Farm diary • The farm diary is provided by Fonterra. Data can be collected by farmers daily. It is not mandatory and farmers can use other means to collect data – the important thing is that the right data is collected. • Front of diary has low frequency data points: animal welfare plan, etc (things you do once a year), then there is data to collect monthly – every month you check things such as fridges, daily (cows brought in, antibiotics used). Other collection methods: • There is some spatial data to support biodiversity but there isn't a framework for biodiversity. Biodiversity is reported in the context of interventions rather than outcome management. • Industry collection system templates • DairyBase (homogenises accounting for farmers) – an industry tool to which all farmers have access. Only 10% of farmers use this but there is increasing interest. DairyBase is not a certification scheme. Farmers input data annually. • Fonterra provides farmers with digital maps of their farms, which provides a baseline. • Fonterra has industry modules that farmers can complete to help farmers work out GHG, soil health, fertiliser management, nutrient leakage, etc. • Dairy Australia conduct surveys, which give guidance on areas for improvement. Fonterra's Sustainability Report 2020[49] reports on indicators i) healthy people, ii) healthy environment and iii) healthy business, where progress is evaluated against stated targets.
Data sources	All data is sourced from the farm.
Other comments	Fonterra has started to do their own farm development plan for environment. They believe they are well placed to deliver environmental schemes because they have daily contact with the farmer. Fonterra has a technology provider for GIS, an in-house specialist, but where they can, they will use off the shelf models (such as Dairy Australia water efficiency use kit). A few farms where Fonterra pays an incentive –farms with customers who will pay a premium. There is an emerging world of farm data that is remote sensing that will make it easier for Fonterra. Need to work through privacy issues. Data collection will work better with farmer collaboration -this is an opportunity. Industry body doesn't see daily transactions for farmers, but Fonterra does. Integrating performance stories with data story is an opportunity. A lot of data is captured via supply chains.
Our data	Interview, Environmental Data Reporting Notes – Sustainability Report 2020[50]

[49] https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2020/fonterra-sustainability-report-2020.pdf

[50] https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2020/2020-environmental-data-reporting-notes.pdf fonterra-sustainability-report-2020.pdf

McDonald's

Type	Supply chain corporation
Status	Existing
Sustainability Focus	McDonald's is a global organisation. From a sustainability perspective, McDonald's priority products are beef, chicken, palm oil, dairy, fibre, fish and coffee. McDonald's has a sustainability framework that includes: • Science-based target goals for emissions by 2030 • Commitments around deforestation (initial commitment set in 2015) • Commitments around packaging and recycling • Offering choices around nutritious meals – particular for products targeted at kids. • Community goals processing Ronald McDonald House Charities (RMHC). Globally, McDonald's works with NGOs and partners to determine the most reputable standards to adopt for priority products. For example, in Australia and New Zealand, all coffee is Rainforest Alliance certified, but globally they accept other programs.
Data collection	Food products • McDonald's stores supplier verification and certification credentials associated with global priority products commitments. This is listed on their website. Workplace ethics and safety • McDonald's has an internal program for social workplace accountability. The scheme is implemented and overseen by a third party, who also collects the data. Environment • Emissions tracking – McDonald's is setting up their own global emissions tracking system that will track progress against their science-based targets. Includes emissions associated with restaurant operations as well as supply chain. • For global suppliers of priority products, McDonald's requires they report to the Carbon Disclosure Project. • McDonald's is working with their top suppliers initially to understand projects and initiatives for chicken and beef suppliers (together they comprise the greatest share of emissions) in global supply chains. Certification/verification documentation is stored internally and used to underpin product claims in public communications – such as the progress report. McDonald's track the information through a system where their suppliers have to report twice a year. For supply chain carbon (e.g. beef data), McDonald's works with a consultant and uses the published national emissions factors data. Workplace ethics and safety data from third-party auditors are used to share best practice stories and areas for focus with suppliers (we do not share externally). Supplier performance is closely monitored by McDonalds and corrective actions must be closed out promptly.
Data sources	• Food products: Suppliers • Workplace ethics and safety: Third-party auditors collect and hold the data. • Internal data warehouse records all products/quantities sourced and supplied to McDonald's restaurants/specifications/ingredients and origin etc.
Other comments	McDonald's is not interested in creating a McDonalds specific certification/verification program for beef; rather, their approach is to work with industry. Eventually if the industry can collaborate and come together to create a framework to pull data together to validate improvement and sustainability, then this becomes the ability for McDonald's to point to programs that exist to validate the product they are sourcing.
Our data	Interview

Woolworths	
Type	Supply chain corporation
Status	Existing
Sustainability Focus	Woolworths has a 2025 Sustainability Plan that is publicly available. For next year, the commitment is to communicate what they think sustainability in agriculture looks like and what they think are the priorities. The plan has varying degrees of maturity on sustainability – some areas, such as food waste are more defined because there is more data. The plan sets out goals under three pillars: People, Planet, Product. These pillars are underpinned by goals that are underpinned by over 40 commitments. There is also a sustainability report that is produced annually. Woolworths will eventually be thinking about metrics and indicators. It is important to consider the existing frameworks, particularly beef, and see how they can align with them. They also value customer perspective and customers want transparency with what is happening in the supply chain.
Data collection	Data is used to report on sustainability progress in the annual sustainability report. Data targets are complex due to varying arrangements. At the moment, there are no certification requirements for suppliers. Relationship with supplier is important and suppliers need to be taken along the sustainability journey. Woolworths need to understand where their suppliers sit with respect to best practice. The 2021 sustainability report appendix[51] contains the following data: • Sustainability metrics: total CO_2 emissions (t CO_2e), electricity use, emissions from facilities, transport emissions by use, waste (tonnes) • Workplace metrics: safety and performance (work related injuries)
Data sources	Suppliers
Other comments	There is an expectation from customer or shareholder for Woolworths to have an understanding of what is happening along supply chains so Woolworths are moving in that space. For emissions, they have set targets for Scope 3 which means they go down the supply chain. A lot of multi-nationals (e.g. Unilever, Coca Cola, Nestle) are part of the global disclosure system. These systems are a method of gathering environmental data. This is a rigid way of gather data.
Our data	Interview Woolworths Group Sustainability Plan 2025[52] Woolworths Group 2021 Sustainability Report appendix

[51] https://www.woolworthsgroup.com.au/icms_docs/195995_2021-sustainability-report-appendix.pdf

[52] https://www.woolworthsgroup.com.au/icms_docs/195860_sustainability-plan-2025.pdf

Type	Supply chain corporation
Status	Existing
Sustainability Focus	JBS has an on-farm assurance program, which involves OH&S, animal welfare and grass-fed certification. The program has expanded from lamb into beef. To date, there are now certified programs for lamb, beef and natural grain. These are customer-based programs. Roughly 2500 beef and 1100 lamb producers are aligned with the program. These programs have varying requirements and certifications to meet JBS compliance standards. JBS has a goal to be net zero by 2040. Customers have stated sustainability is important to them, so a group of producers met with customers to determine on how to achieve sustainability within the program. The pillars[53] to the sustainability program are: • Soils: Understanding soils and the importance of a healthy balance • Pastures: Matching the right mix of pastures to the environment they are grown in • Vegetation: Protect soil coverage, assist in maintain healthy waterways, and recognise current and past efforts • Water: Ensuring the use of quality water and managing the water usage for maintaining stock health and maximising animal and plant production • Livestock: Ensuring the wellbeing of our livestock is of paramount importance • People: Providing a healthy and safe workplace environment for employees, families and owners • Carbon management: Assessing the current greenhouse gas (GHG) emissions within the Great Southern value chain to enable a working baseline for improvement. Achieve a net zero position for Great Southern Farm Assurance in line with the global JBS net-zero GHG emissions by 2040 target. JBS Food Groups published their 2020 Sustainability Report[54], which details their sustainability approach and performance and includes Australian facilities. JBS Australia is a found member of the Australian Beef Sustainability Framework. JBS USA is a founding member of the Global Roundtable for Sustainable Beef and the US Roundtable for Sustainable Beef. JBS Foods Canada is a founding member of the Canadian Roundtable for Sustainable Beef.
Data collection	JBS contracts third-party audits to farms every 18 months as part of the on-farm assurance program. The questions in the audit pertain to benchmarking where producers are at. The producer completes about 30 questions, which are weighted and ranked and give a score out of 100. There are 2 parts: supplying the documentation to back up answers to questions and approval by auditor. Although there is an index score, it is a descriptor only and producers do not need a score to be certified.
Data sources	• Plant data – easily monitored and collected • Livestock emissions data gathered from supply chain. Has a consultant to help with that. Emissions questionnaire– over a 2-year project – this gives a rough idea of livestock emissions from supply chain. • Also collects data on-farm and carcass data, animal health data (occurrences of animal health issues), objective carcass measurement – pass info to producers
Other comments	JBS needs to differentiate themselves from everyone else because of their brands. They've diversified their brands. A 'flat' platform doesn't give them the ability to differentiate their products. The challenge is accommodating differentiation. From an industry perspective, you need to cover off the minimal components – then differentiation can occur above this. The Beef Sustainability Framework was set up to cover minimal components. Let the market decide to where it goes after that. JBS would consider including other environmental and biodiversity components in their program if customers desire it.
Our data	Interview JBS 2020 Sustainability Report[55]

[53] https://www.foodanddrinkbusiness.com.au/news/sustainability-pillars-jbs-great-southern

[54] https://sustainability.jbsfoodsgroup.com/chapters/about-this-report/

[55] https://jbs.com.br/wp-content/uploads/2021/08/-sustainability-in-report-jbs-2020.pdf

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