

AASF Data Ecosystem Project

March Workshop Report
V1.0

David Lemon, Ashlin Lee, and Alyce Lythall
May 2024

Citation

Lemon D., Lee A., and Lythall A. (2024). AASF Data Ecosystem Design – March Workshop Report. CSIRO, Australia.

Copyright

© Commonwealth Scientific and Industrial Research Organisation 2024. To the extent permitted by law, all rights are reserved and no part of this publication covered by copyright may be reproduced or copied in any form or by any means except with the written permission of CSIRO.

Important disclaimer

CSIRO advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

CSIRO is committed to providing web accessible content wherever possible. If you are having difficulties with accessing this document please contact csiro.au/contact.

About this document

This report documents the AASF Data Ecosystem Major Workshop held in March 2024. This workshop aimed to co-design the Data Ecosystem with key stakeholders, including defining potential use cases. The report presents the background leading up to the workshop, the workshop methodology, findings and insights from the workshop (including use cases for the AASF Data Ecosystem), and discussion and recommendation based on this.

Section 1 gives the background to the workshop in the context of the broader AASF Data Ecosystems project.

Section 2 presents the methodology for the workshop, including the agenda and session descriptions.

Section 3 provides findings and analysis from the workshop, including use cases, values and principles, and lessons learnt.

Section 4 describes recommendations and next steps.

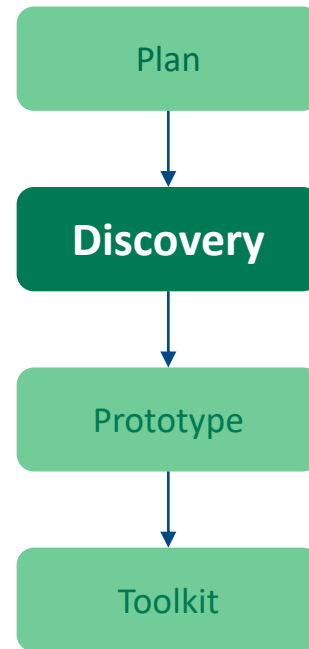


Table of Contents

Summary	4
1.0 About this project	6
<i>Background</i>	7
<i>Methods</i>	8
2.0 AASF CoP Workshop - Methodology	9
<i>Focus</i>	10
<i>Agenda</i>	11
<i>Sessions</i>	12
3.0 AASF CoP Workshop – Findings and Analysis	18
<i>Vision, Objectives and Principles</i>	19
<i>Use Cases</i>	22
<i>Data ecosystem Components</i>	33
4.0 Summary and Next steps	35

Executive Summary

This Report

This report is the final output of the Discovery Phase of the AASF Data Ecosystem Project. It serves three purposes:

1. *Report on the activities of a workshop of the AASF Community of Practice (CoP) held over March 20th and 21st 2024; and*
2. *Describe the Vision, Objectives, Principles and Use Cases for the AASF Data Ecosystem developed during that workshop,*
3. *Describe the components/elements that the AASF Data Ecosystem will need to enable the data ecosystem use cases*

Findings

Vision

“Empowering Australian agriculture through a trusted, interoperable data ecosystem that ensures informed decision making, fosters continuous improvement, collaboration, and creates enduring benefit for the entire agricultural value chain”

Objectives

- Improved collaboration, cooperation, and coordination
- Reduce the burden on data owners
- Improved interoperability and usefulness
- Improved availability and access
- Improved reliability/trustworthiness
- Increased investment
- Increased uptake and use of sustainability data

Principles

- Findable, Accessible, Interoperable, Reusable (FAIR)
- Secure
- Usable
- Accessible
- Equitable and ethical
- Privacy by design
- Integrity
- Value additive

Use cases

- 1.1 - Develop National Scale Sustainability Data
- 1.2 - Develop National Sustainability Data Standards
- 2.1 - Trace Sustainability Credentials Along a Supply Chain
- 3.1 - Create Corporate Sustainability Report
- 4.1 - Assess Client Sustainability Credentials
- 5.1 - Benchmark Sustainability Credentials
- 6.1 - Access Subsetted Aggregated Sustainability Data
- 7.1 - Assess farm sustainability
- 7.2 - Improve farm sustainability

Recommendations

It is recommended that the AASF Community next:

1. Review, provide comment and adopt the vision statement, objectives and principles for the AASF Data Ecosystem
2. Endorse the AASF Data Ecosystem use cases and identify the 5 highest priority use cases.
3. The project proceed with prototyping key components needed to support the high priority use cases.

1.0 About this project

The Australian Agricultural Sustainability Framework

The Australian Agricultural Sustainability Framework (AASF) is the first country-specific framework to address sustainability from a whole-of-agriculture perspective. It is being developed by the National Farmer’s Federation (NFF) to provide benefits to farmers and the community by promoting best practice in agricultural sustainability and ensuring these efforts can be recognised by international markets and the community.

Development of the AASF is being undertaken using a phased approach with each phase consisting of a set of discrete tasks.

Previous phases have:

- Undertaken foundational research
- Develop the initial framework of the AASF
- Explored incentives for use
- Undertaken an initial data analysis
- Benchmarked existing frameworks
- Explored legal and policy barriers
- Create a AASF Community of Practice (COP)

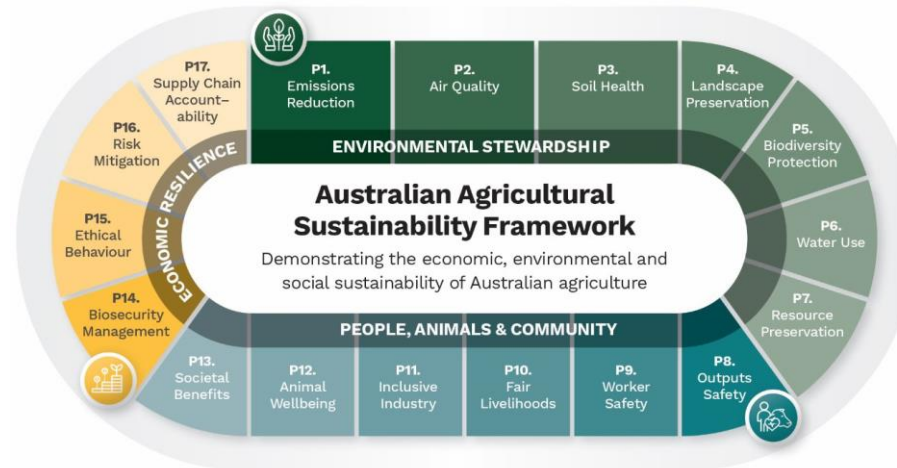
The current stage (Stage 2) is continuing to develop the AASF towards operationalisation. It includes tasks to:

- Complete a materiality assessment against the AASF’s 17 principles
- Develop a model report for the AASF
- Undertake a series of pilots using the framework
- Continue the activities of the AASF COP
- Design a data sharing ecosystem to support the Australian agricultural sustainability sector.

Further information on the framework and its various programs of work can be found at aasf.org.au

The AASF Data Ecosystem

Analysis conducted by CSIRO in 2021/22 found that, within the Australian agricultural sustainability sector, there are no uniform data sharing arrangements; no standards for data interoperability; and varying levels of governance capability maturity amongst data providers and users. It further found that publicly available data that might be of relevance to the AASF, have varying levels of sustainability, usability, and accessibility.^{1,2}



Discussions with the AASF Community of Practice (CoP) led to the realisation that the AASF needs to be supported with robust and logically connected mechanisms for governing data sharing activities. This would require the definition of use cases, appropriate institutional arrangements, and instilling a culture of trust and collaboration that enables the AASF community, data policies, and information systems to effectively function.

Building on previous work, the AASF Data Ecosystem project will:

- Help the primary AASF stakeholders understand the issues that the AASF data ecosystem will need to address
- Propose a governance model and set of institutional arrangements for the data ecosystem that have been co-designed, tested and endorsed by the AASF community
- Provide a clear path for implementing and supporting the AASF data ecosystem

These are intended to be achieved by December 2024.

Ultimately, as a result of this project, stakeholders will understand the mechanisms by which the data needed to support use of the AASF can be identified and assessed for suitability; and, have a robust approach to developing appropriate supply arrangements which support ongoing availability and use of this data.

1. Lemon, D; Tetreault Campbell, S; Whitten, S.(2022) Australian Agricultural Sustainability Framework - Data Analysis. National Farmers Federation: CSIRO. csiro:EP2022-0856.
 2. Lemon D (2022) Australian Agricultural Sustainability Framework – Review of Publicly Available Data Sets. CSIRO, Australia

The AASF Data Ecosystem project has 4 distinct phases, as described below. This report includes information relevant to components of Phase 2 – Discovery.

1.Planning (Aug – Sept 2023)

Purpose

- *agree with primary stakeholders on timing, activities, outputs and outcomes for the project*

Activities

- *Intent workshop with primary stakeholder (August 2023)*
- *Seek ethical approval from CSIRO Ethics (Approval: 144-17)*

Outputs

- *Project Intent and Plan – including: project impact strategy, project timeline, research plan, initial lines of enquiry*

2.Discovery (Oct 2023 – Mar 2024)

Purpose

- *Engage with key stakeholders to understand current approaches, needs, expectations, concerns and desires for the AASF Data ecosystem*
- *Identify key use cases; determine requirements, agree on vision, objectives and principles*

Activities

- *one-on-one Interviews with key stakeholders (Oct 23 – Feb 24)*
- *review of published literature (academic, company websites, reports, etc.)*
- *minor workshop with key stakeholders (Nov 15 2023)*
- *major workshop (March 20/21 2024)*

Outputs

- *Discovery Report*
- *Major Workshop Report **[this report]** – describing agreed vision, etc*

3. Prototyping (Apr – Dec 2024)

Purpose

- *Develop and test different institutional arrangements and system mechanics to support 5 priority use cases*
- *Provide recommendations to primary stakeholders on next steps*

Activities

- *Focus group activities to test individual prototypes*

Outputs

- *Recommendations report*

4.Toolkit (Jan – June 2025)

Purpose

- *Capture and publish knowledge gained from the project*

Activities

- *Paper and report writing*

Outputs

- *Data Ecosystem Design toolkit*

2.0 AASF CoP Workshop

- Methodology

Workshop Focus

Held over 2 days, the AASF Data Ecosystem Major Workshop brought representatives from across Australia's agricultural sustainability sector together to focus on:

- developing a vision that encompasses the goals of the community;
- defining vision and principles; and
- identifying and developing priority use cases for the data ecosystem.

Day 1

- Identify key actors and their interactions
- Identify use cases

Presentation of the findings from the AASF Data Ecosystem Discovery phase followed by a set of guided activities with participants working individually and within pre-determined table groups

Day 2

- Develop priority use cases
- Develop vision
- Identify key principles

A set of guided activities with participants working within self-selected table groups to develop the most needed use cases, and identify the vision and principles for the Data Ecosystem

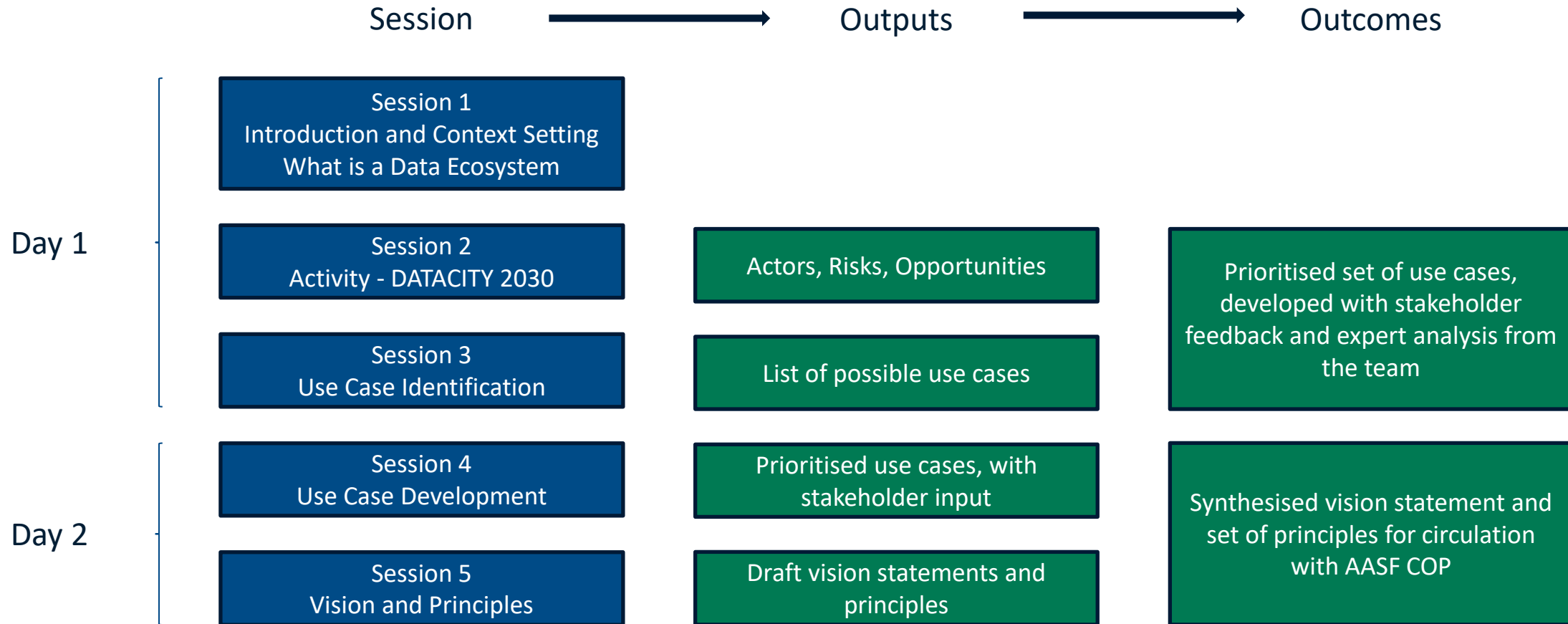
Participants

Participants were members of the Australian Agricultural Sustainability Framework (AASF) Community of Practice (CoP) and included representation from:

- Research
- Government
- NGOs
- RDCs
- Existing Commodity Sustainability Frameworks
- Producers
- Finance

Agenda

The workshop agenda was built around a series of sessions that aimed to create specific outputs to support the desired outcomes of the overall project. These sessions and their activities, the outputs, and the ultimate outcomes they service are described below:



Session 1: Introduction and Context

The workshop opened with an information session led by the Data Ecosystem Project team. This session reminded participants what the AASF Data Ecosystem project is aiming to achieve and where this workshop fitted within the overall project plan.

This was followed with a brief presentation to the audience on the findings of the Discovery Phase¹ of the project. The key points of this presentation were:

1. There are many ways to classify the various stakeholders within the AASF data community. Two insightful classifications are :
 - ❖ The role an organisation has within the data supply chains it is involved in. Categories here include:
 - **Data producers** – undertake activities from which they or others may wish to capture data for sustainability purposes
 - **Tool providers** – provide tools/technologies that help with the measurement/ collection/capture/sharing of sustainability related data
 - **Data users** – need access to sustainability related data from others to support their own purposes
 - ❖ The interest an organisation has in the AASF. Categories include:
 - Those involved/interested in **national scale sustainability reporting**
 - Those involved/interested in **supply chain/portfolio sustainability reporting**
2. That the current agriculture sustainability data ecosystem is anarchic in nature
3. Different drivers are informing how organisations develop their data practices, frameworks and governance arrangements

4. Data sharing within the agricultural sustainability community is undertaken on an ad-hoc basis
5. Different users will engage with and use the AASF and hence the AASF Data Ecosystem in different ways
6. Stakeholders can see a range of benefits coming from the AASF Data Ecosystem
7. The greatest opportunity of and the greatest risk to the data ecosystem is trust



1. From Lemon D. and Kostanski L. (2024). AASF Data Ecosystem Design – Insights Report. CSIRO, Australia.

Session 2: DATACITY2030

To encourage participants to think about and document the key components of a data ecosystem in a collaborative way, the project team developed an original “game” for participants to play - DATACITY2030.

Purpose

The purpose of this task was to imagine a future AASF data ecosystem, identifying the key attributes that would be necessary for any system to succeed. These included:

- **Actors** – the different kinds of human entities operating in the context of data ecosystems (as previously noted in the Insights report)
- **Technical Components** – the technical systems and infrastructure required for a data ecosystem to succeed
- **Governance and Institutional Arrangements** – systems of rules, regulations, accountabilities, and governance structures necessary for the ecosystem to function

Once these specific components had been identified, participants were asked to consider the implications of their future vision. This included:

- **Risks** to their future data ecosystem; and
- **Opportunities** that their future data ecosystem may yield or leverage for success

Participants were also asked to note who might own or realise their contribution (e.g. if a participant noted a risk, they were encourage to note how it might be mitigated and who might be responsible for this).



Session 2: DATA CITY 2030

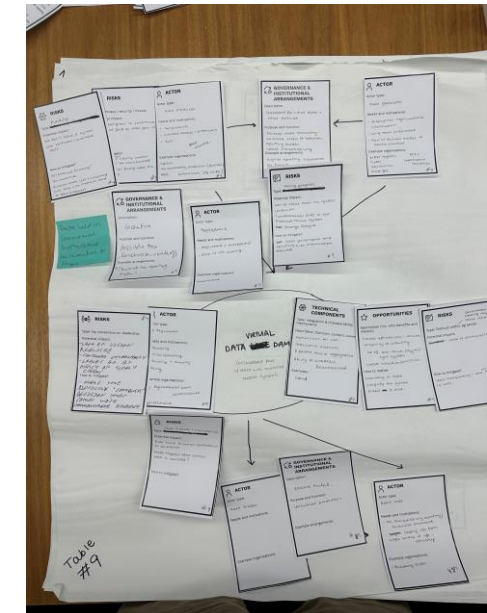
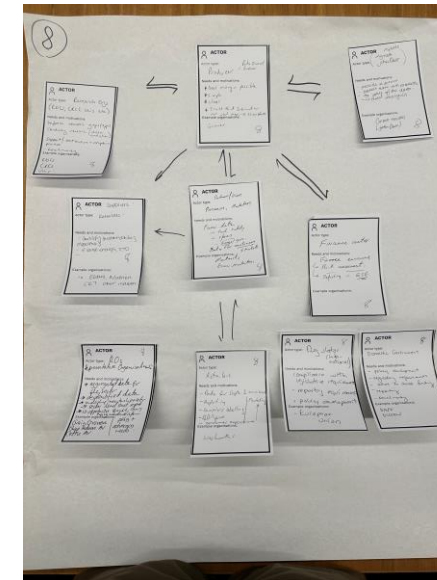
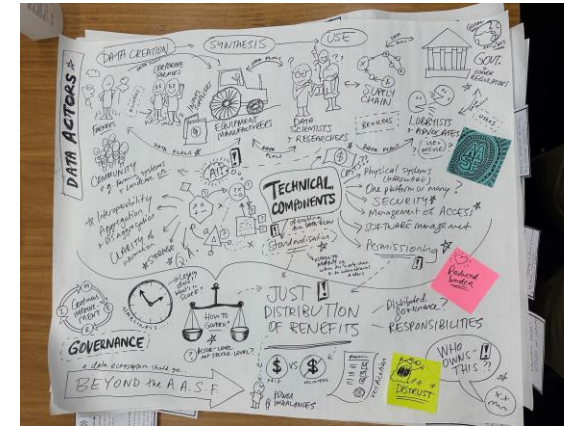
Method

Participants ‘played’ in pre-assigned table groups. Each table was provided attribute cards (actor, technical component, governance, risk, opportunity), paper, pens and flip charts. They were asked to build their vision of a future (circa 2030) data ecosystem for AASF by filling out these cards and attaching them to a flipchart (including any other notation or explanation required). This was done in two stages.

Initially, teams identified the key actors, technical components and governance arrangements within their vision of the future. Once complete, teams were then asked to consider risks and opportunities.

Outcomes

Through the outputs of this activity (completed DATA CITY 2030 responses) the Data Ecosystem project team gained an understanding of what attributes – and their implications – stakeholders believe will be included in a future AASF Data ecosystem along with required governance and institutional arrangements necessary for success. This knowledge will be used to prototype and test different governance arrangements in the next phase of the AASF Data Ecosystem project.



Sessions 3: Use Cases

Building on the work conducted on the shape of their desired future data ecosystem, participants were asked to consider the use cases that their ecosystem might support, and which are the most important.

Purpose

To identify priority use cases that the AASF Data Ecosystem needs to support to be useful for the AASF community.

Method

This session started with a brief description from the project team of the concept of a use case and their purpose. That is, a use case is defined as “a specific situation or scenario in which a system could potentially be used to achieve the goal of the user”. They are used to inform the design and development of systems/services/products by clearly articulating how the system should function and how it might meet user needs.

Participants were then asked to individually brainstorm as many use cases for their AASF Data Ecosystem as possible. For each use case they were to include who the primary actor for the use was and why it is important.

At the conclusion of the brainstorming period, participants rejoined their table-based teams to share and discuss their use cases, collate like use cases and then, and as a team, identify the 4 highest priority for further development. Each table then supplied their high priority use cases to the project team who synthesized them further to produce a list of 14 use cases (table right).

This concluded Day 1.

Proposed Use Case

- 1 Primary producers access data to inform/guide practice change on farm to improve/increase sustainability/resilience/profitability
- 2 Austrade/DFAT/DAFF access national scale data to prove sustainability credentials in market access negotiations
- 3 Retailers/exporters/processors trace sustainability credentials along supply chain
- 4 NFF/commodity level Sustainability Frameworks access national scale data to support sustainability reporting
- 5 Corporate entity accesses data associated with their supply chain/portfolio of clients to undertake regulatory reporting
- 6 Finance sector accesses relevant individual's/organisation's data to assess risk and provide financial products
- 7 Producers, processors, corporate entities benchmark themselves against industry sustainability standards
- 8 Industry/government accesses data to understand sustainability at a local/regional scale
- 9 Government uses sustainability data to guide policy development, investment and management
- 10 Industry groups/government identify gaps in data availability to support further data investment
- 11 Researchers access sustainability data to support research activities
- 12 Research investors analyse data to prioritise research investment
- 13 Data owners submit/provide their data for use
- 14 Public and community access aggregate data for their needs

Sessions 4: Use Cases continued

Participants were asked to work within a team to help provide details on the use case of highest interest to them.

Purpose

To add details to the priority use cases identified in the previous session and then select the 5 highest priority use cases to be prototyped in future stages of the Data Ecosystem project.

Method

Each of the use cases identified on the previous day was allocated to a table and participants asked to self select which table (use case) they wished to contribute to. Due to limited numbers and similarity of use cases, some tables were merged (Use Cases 2 and 4) whilst others, which had limited interest, were not further developed.

Using a template provided, each table collectively identified key details for the use case. This included:

- Primary User
- Other users/beneficiaries
- Tasks/Jobs to be done
- Goals/objectives of the use case
- Any data/technology required
- Measures of success
- Dependencies/constraints
- The workflow to be followed

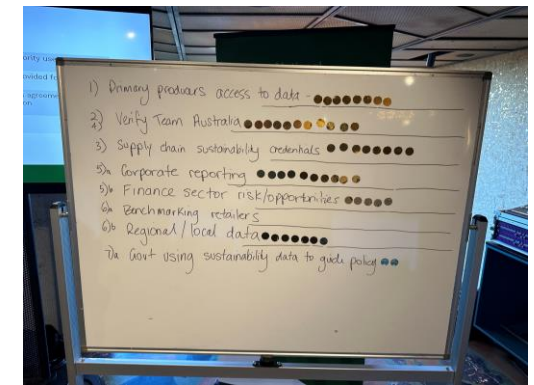
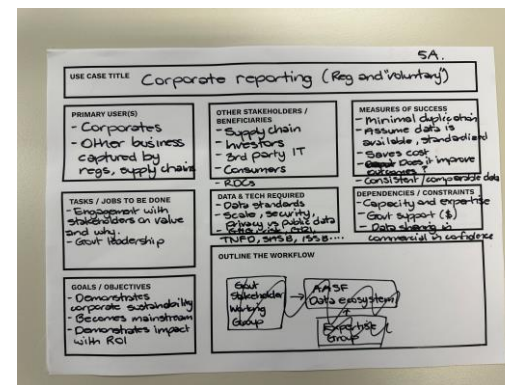
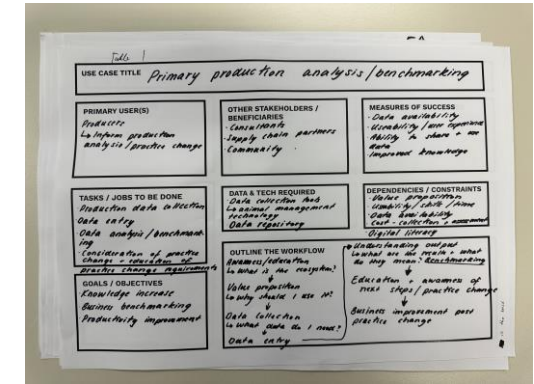
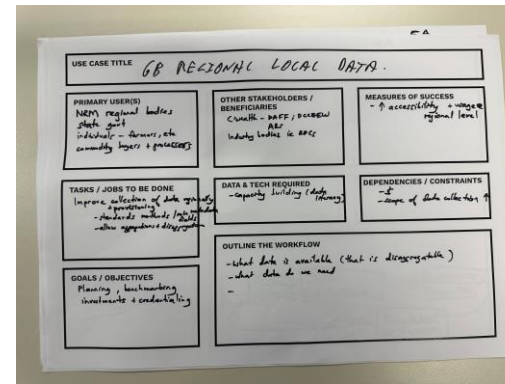
Each team was asked to present their use case to the workshop and finally each participant was given the opportunity to vote on the use case they considered to be the highest priority.

Outputs

The session delivered 8 use case templates for further analysis by the project team. See Section 3

Outcomes

The session generated an understanding of the most desired use cases for AASF Data Ecosystem that the project team needs to consider, and the different components and relationships encompassing this.



Session 5: Vision and Principles

Alongside documenting the potential shape and use cases of the AASF data ecosystem, the project team took the opportunity to explore with participants how the AASF Data Ecosystem should act and operate to the benefit stakeholders, through exploring possible visions and principles.

Purpose

To identify a common vision and set of principles that could guide the operation and direction of the AASF data ecosystem.

Method

After a brief introduction participants were asked to brainstorm and record a vision statement and set of principles in groups, and report these back to the audience. Responses were later synthesised by the project team (See Section 3).

For this activity:

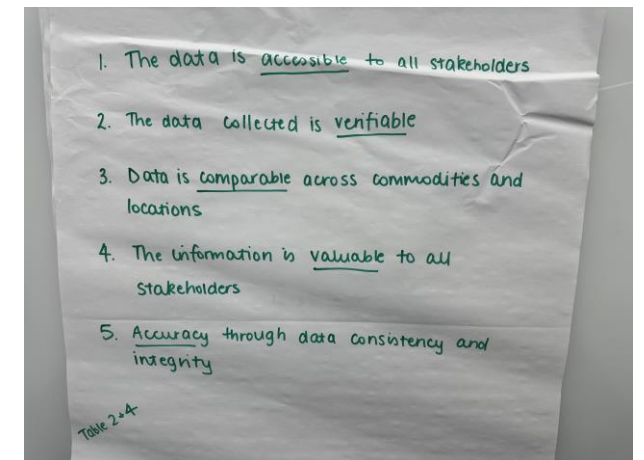
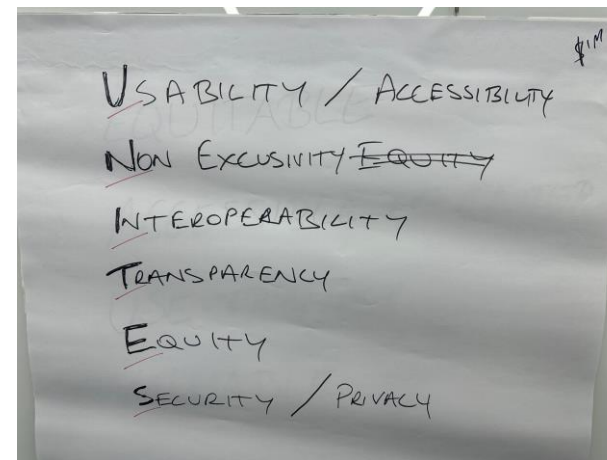
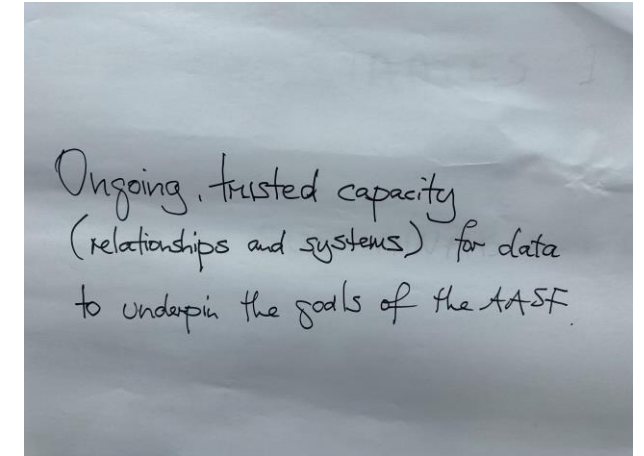
- Visions were defined as the aspiration or ideal future state for the data ecosystem.
- Principles were defined as the desired rules, patterns and boundaries for how entities should act in the context of the data ecosystem.

Outputs

A set of principles and visions that stakeholders desired for the AASF data ecosystem.

Outcomes

The project team gained an understanding of what principles, direction, and values any AASF data ecosystem need to adhere to, to successfully meet the needs of AASF stakeholders.



3.0 AASF CoP Workshop - Findings and Analysis

A key outcome of the workshop was to encourage alignment across the cohort regarding the collective vision for the AASF Data Ecosystem, and what a thriving AASF data ecosystem could enable. As noted in the Discovery research, there was some misalignment amongst participants around the purpose, goals and perceived impact of the AASF data ecosystem. Vision statements are concise, aspirational statements addressing goals and impact, and were selected as a useful mechanism to build consensus and alignment.

To complete the second day's activities and provide a concise summation of discussions, each table was invited to craft a Vision statement for the AASF data ecosystem, building upon their ideations inspired by the DATA CITY 2030 game of the previous day, as well as their use case elicitation.

A total of eight Vision statements were completed (see images on right).

From these eight statements, multiple aspirations across two dimensions can be articulated:

- **Practise and performance goals:** empowering sustainable performance; enabling demonstration and reporting of sustainable practises; data-driven decision making and a data-driven value chain
- **Data/system goals:** standardised and interoperable data; secure systems for sharing; data is connected, open and available; data is relevant, accurate and trustworthy; data is economically produced and used for multiple purposes (equivalency)

Draft vision statement for the AASF and its associated data ecosystem:

“Empowering Australian agriculture through a trusted, interoperable data ecosystem that ensures informed decision making, fosters continuous improvement, collaboration, and creates enduring benefit for the entire agricultural value chain”

Next steps: As part of the next project phase, it is recommended this Vision Statement be tested with project stakeholders for further iteration and refinement.

"A standardised, open & accessible, collaborative information sharing system, that demonstrates Australian agriculture's sustainability credentials."

AUSTRALIA
DEMONSTRATES IT IS
CONTINUALLY IMPROVING
THE SUSTAINABILITY
OF ITS FOOD AND
FIBRE PRODUCTION

THE TRUSTED ONE-STOP
DATA SHOP FOR
SUSTAINABLE AGRICULTURE
TO ENHANCE DECISION MAKING

Empower and enable
sustainability performance for
Australian agriculture
(and reporting?)

Ongoing, trusted capacity
(relationships and systems) for data
to underpin the goals of the AASF.

Our data,
Your assurance
Data: relevant, accurate, secure.
Seamlessly collected once but for
multiple uses
Assurance: Trusted & cost-effective

CREATE A CONNECTED
& INTEROPERABLE
ECOSYSTEM THAT
ENABLES STAKEHOLDERS
OF THE AGINDUSTRIES TO
CREATE BENEFITS FROM
DATA

DRIVING A SUSTAINABLE
AGRICULTURAL ECOSYSTEM,
EMPOWERING INDUSTRY TO
UTILISE DATA TO SECURE
AGRICULTURAL VALUE CHAIN
FOR GENERATIONS TO COME.

AASF Objectives



Objectives (sometimes referred to as goals) are measurable outcomes that the community is seeking to achieve through the implementation of the data ecosystem. These are different from the vision, principles and use cases in that they are measurable and something that the entire community is seeking to achieve rather than an individual stakeholder.

The workshop did not include a dedicated session on objectives as time did not permit. However, analysis of the outputs from the DATACITY2030, use case identification/development and vision/principles sessions, was used to identify the community's objectives for the AASF Data Ecosystem. Statements captured during each of these exercises often reflect a particular goal or objective that those making the statement holds.

A process of analysing each workshop output for statements underpinned by a general objective then collating like statements was undertaken. This revealed that the AASF community has the following objectives for the AASF Data Ecosystem:

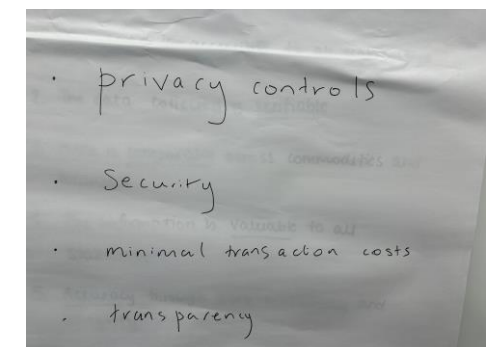
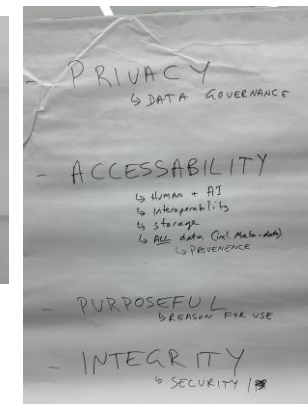
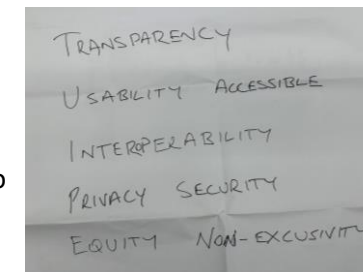
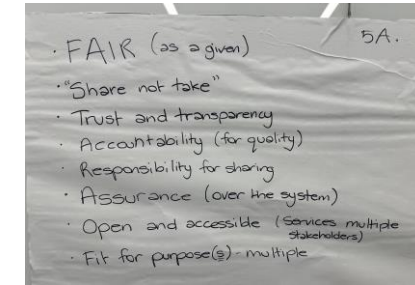
- **Improved collaboration, cooperation, and coordination** between participants/stakeholders – this includes coordination between government and industry as well as across the agriculture industry more generally. A specific goal here is coordination across the ag tech sector through the adoption of standards.
- **Reduce the burden on data owners** through increased utilisation of data (collect once, use many) and reduced complexity (fewer digital tools as well as agreement on what information will be requested.)
- **Improved interoperability and usefulness** of sustainability data – through implementation of standards for sustainability measures (what data is collected) as well as how it is encoded and shared.
- **Improved availability and access** of sustainability data – enabling greater utilisation of data and hence value generation from it.
- **Improved reliability/trustworthiness** of sustainability data – through implementation of standard sustainability measures and data collection programmes
- **Increased investment** in sustainability data – particularly where identified gaps exist.
- **Increased uptake and use of sustainability data** – to enhance evidence-based decision making and improved sustainability practice

AASF Ecosystem Principles

Supporting the vision and objectives of the AASF ecosystem are key principles: desired rules, patterns, and boundaries for how the AASF Data Ecosystem will work internally and externally. Developing a set of key principles that stakeholders agree upon is central to the operational success of the ecosystem.

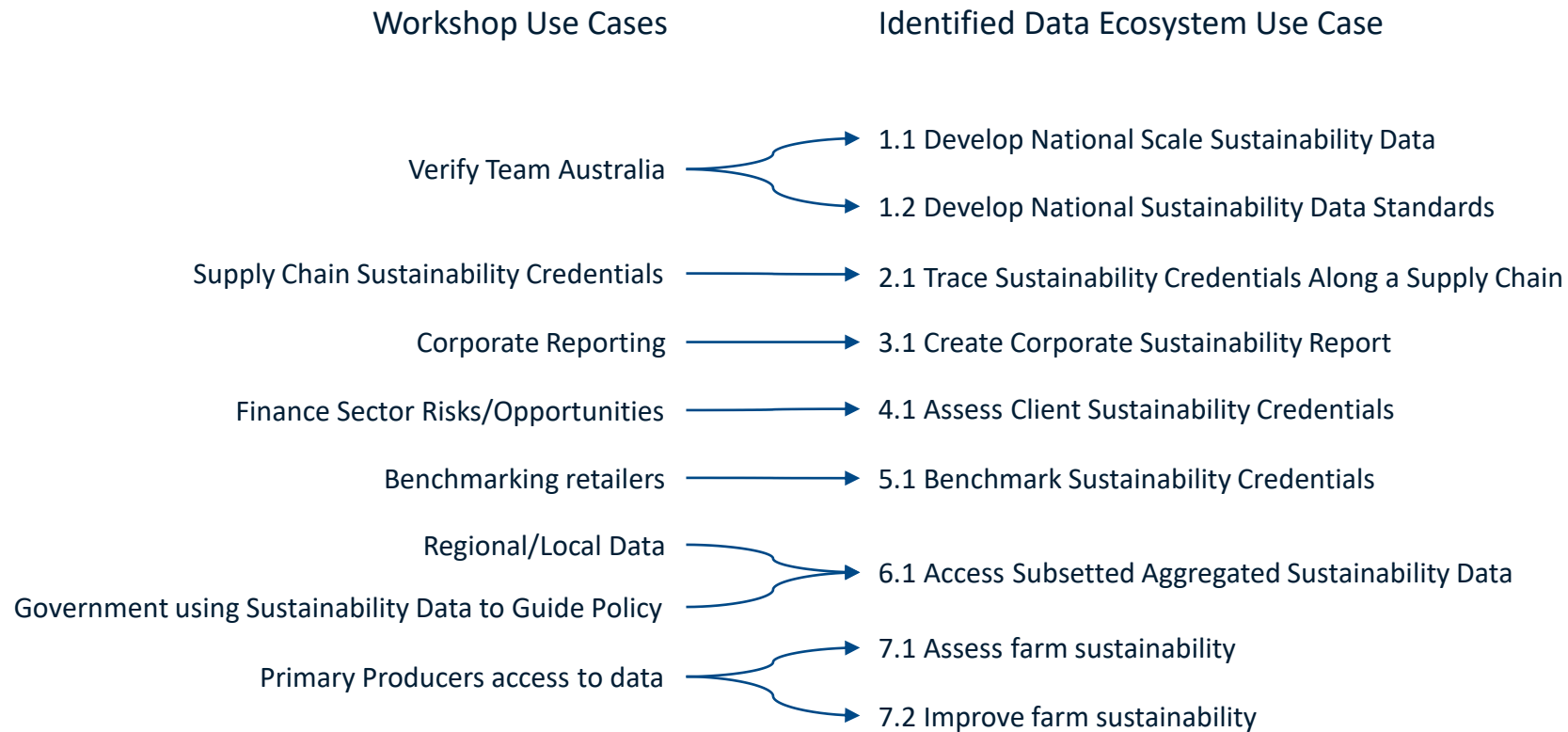
Following the workshop, the project team analysed the principles captured during the Vision/Principles session (See Page 17) using an affinity mapping process, where individual principles were sorted and then categorized into like principles. From this analysis, the following principles for the AASF Data Ecosystem were distilled:

- **Findable, Accessible, Interoperable, Reusable (FAIR)** – In keeping with existing global best practice, participants consistently raised the need for data to be FAIR in nature and have the appropriate infrastructure necessary to enable this amongst stakeholders. This included data governance, metadata and provenance systems, storage, machine readability.
- **Secure** – The data ecosystem should be secured against cyberphysical threats (i.e. cybersecurity issues), and have appropriate security measures for all actors involved in the data ecosystem (including suppliers, users, and other roles)
- **Usable** – The ecosystem should be user friendly, and have a user experience that supports the ecosystem use cases and practice of stakeholders
- **Accessible** – Both participation in, and the use of the ecosystem, are accessible to a variety of stakeholders. This means that all stakeholders who want to participate are supported by the system to do so, *and* that the ecosystem is usable for all, no matter their ability or circumstance
- **Equitable and ethical** – The AASF data ecosystem should be equitable in nature, and promotes equitable outcomes for participants, including fairly distributing workloads and benefits, operating in a non-extractive manner, not excessively taking or disadvantaging participants, that the ecosystem does no harm, and adheres to ethical principles of data use and collection (i.e. informed consent)
- **Privacy by design** – The AASF data ecosystem should be designed with privacy in mind, establishing and maintaining privacy controls for participants and respecting their privacy choices
- **Integrity** – The AASF data ecosystem should gain and maintain the trust of stakeholders. This includes through the transparent operation of the ecosystem and its data assets, and providing ongoing assurance and accountability across the data supply chain to maintain the integrity of the system and its data assets
- **Value additive** – The AASF ecosystem should provide clear value to stakeholders by minimising transaction and participation costs while creating value in a non-exclusive way



Use Cases: Overview

The use case development session on the morning of the second day of the workshop delivered 8 use case templates. Analysis of these templates was conducted by the project team to identify novel use cases, and where necessary, combine similar ones. This analysis revealed 9 distinct use cases as shown below.



Use Cases: Overview

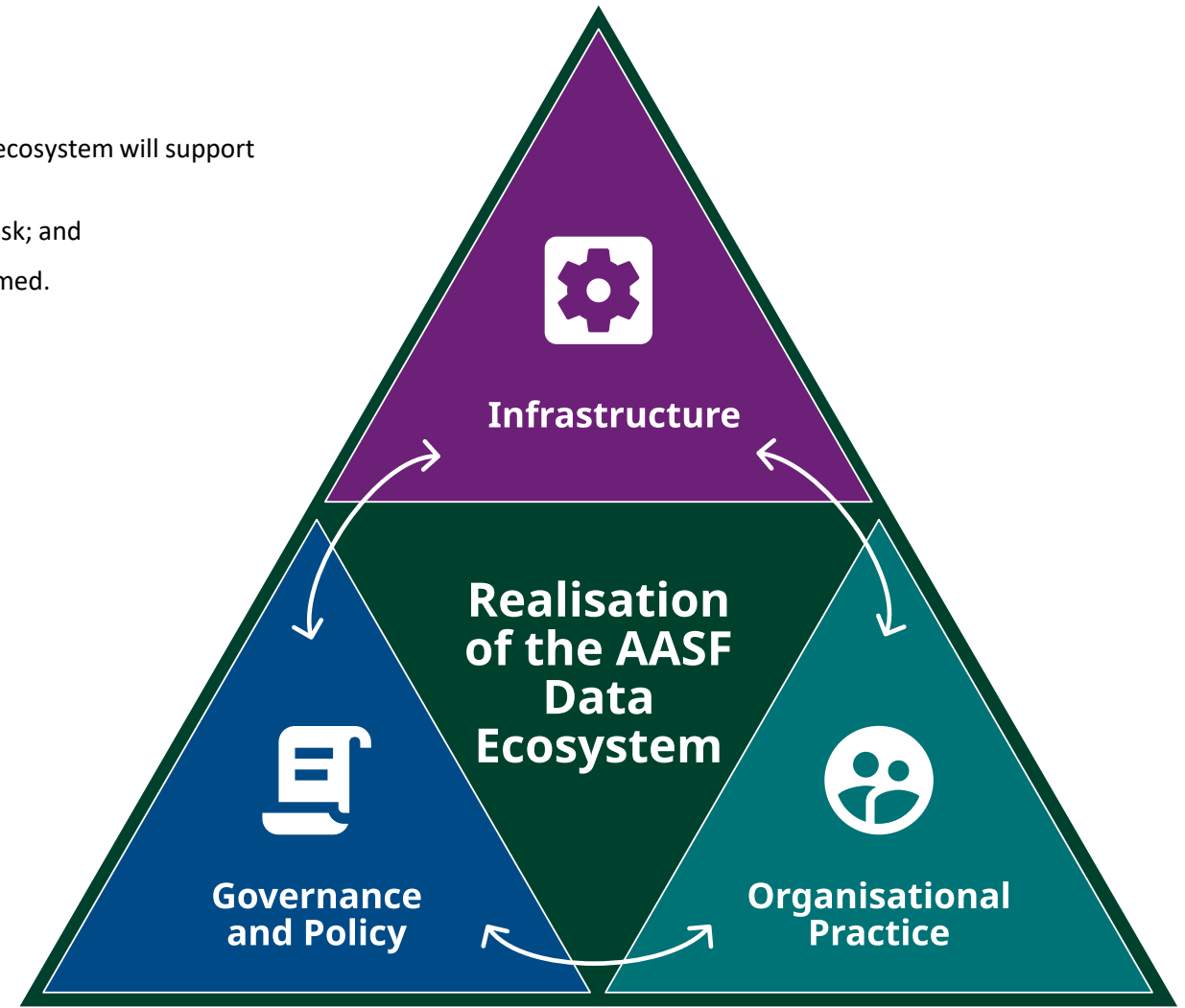
The following pages describe each of the identified Data Ecosystem use cases in further detail. This includes:

- The **Primary User** – the individual or group seeking the output from the task
- The Primary User’s **Objective** in undertaking this task (why the task is being performed)
- The **Use Case Details** – the task or activity the Primary User is performing that the data ecosystem will support (what are they doing)
- **Other Stakeholders** - other people or organisations that have a role or interest in the task; and
- Any **Dependencies/Constraints** that need to be met for the task to be able to be performed.

Each description also includes an identification of the components or functions the AASF Data Ecosystem will need to include to be able to support the use case. Some of these components will be prototyped and tested in the next phase of the project.

For each component, an indication of the type of capabilities that the component will need to include is provided. These capabilities are:

- **Infrastructure** – technical capability with associated governance, maintenance and administration
- **Governance and Policy** – decision making, accountabilities and responsibilities, rules, determinations and positions on things material to the AASF Data Ecosystem
- **Organisational Practice** – the ways that people and organisations work together to realise the AASF Data Ecosystem. The AASF CoP is an example of an organisational practice.



Use Case 1.1 – Develop National Scale Sustainability Data Sets

Primary Users

Commodity Sustainability Frameworks, Government Trade Negotiators

Use Case Objective

Users associated with government and commodity-oriented sustainability frameworks, who wish to address the challenges associated with discovering, accessing, developing and using national scale sustainability data. These data sets will be used for a range of national level sustainability related reporting and analysis activities.

Use Case Details

There are two primary tasks associated with this use case:

1. Establishing a collaboration process around national scale data sets, so that key questions and actions around national scale data sets can be addressed
2. Establishing a process of dataset development and maintenance, so that users needs are met and value from the data sets might be generated

Other stakeholders

- Researchers – interested in developing methods for new data sets
- Data developers – involved in creating and maintaining data sets
- Technology providers - involved in supporting these data sets
- Data custodians of national scale data sets – potential collaborators and enablers for this user case

Dependencies/Constraints

- Requires a willingness and ability for parties to work together
- Requires (ongoing) access to relevant data sets
- Potential ongoing costs (time, money, effort) in maintaining data sets and collaboration practices

Commentary

This use cases reflects the fact that presently there is little to no coordination around the development of national scale sustainability related data sets despite some commonality of requirements. The result is an inefficient mix of different approaches to collecting similar data, multiple collections of the same data, and data gaps.

The AASF Data Ecosystem can support this use case in several ways:

- Provide a mechanism to *enable the collaboration process for national scale data set development*; this includes providing defined space(s) for collaboration to occur (physically or online), and a set of rules/policies by which data development and management can proceed (see point below)
- Provide a mechanism for *governance and administration of national scale data sets* developed under the auspices of the AASF Data Ecosystem.
- Provide a mechanism to *enable the collaborative process of defining data standards*, data requirements, and data ownership/licencing/custodianship arrangements required alongside data standards, as well as supporting adoption and ongoing use
- Provide a mechanism for *governance and administration of national data standards* developed under the auspices of the AASF Data Ecosystem.

Data Ecosystem Component	Infrastructure	Governance	Practice
C1: Collaborative mechanisms or spaces for development, implementation, and management of data sets	✓	✓	✓
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards and identifiers		✓	✓
C7: Rules, policies, and governance mechanisms for data set development, implementation, and management		✓	✓

Use Case 1.2 – Develop National Sustainability Data Standards



Primary Users

Agricultural sustainability data users with a national /global lens, e.g. corporate farm data producers, Government reporting or policy makers, global assurance providers, international trading partners

Use Case Objective

Users seek to use nationally relevant standards to reduce risks associated with their sustainability related data and information. This includes, but is not limited to data exchange, data collection, and data use.

Use Case Details

Multiple steps are involved in the development and adoption of standards:

1. Community agrees on what needs to be standardised within the ecosystem
2. Appropriate standards are identified, adapted or developed and then tested
3. Community adopts/endorse the standards for use
4. A programme to encourage use of the standards is implemented
5. The standards are actively maintained/managed

Other stakeholders

- Ag Tech sector – potential implementors of standards
- Data owners (or custodians) – managing access and availability of data sets
- Data developers and solution providers – who might support standard adoption and development
- Members of agricultural data supply chains – who have requirements or views on standards
- Standards organisations – who possess expert knowledge or professional interest in development and deployment of standards

Dependencies/Constraints

- Requires a willingness and ability for parties to work together
- Requires initial investment (time, money, effort) for implementation
- Requires ongoing commitment to manage standards

Commentary

This use case is at the core of many of the other identified use cases for the AASF Data Ecosystem. The outputs from this use case – standards – will be a key enabler for many, if not all, other AASF Data Ecosystem supported use cases. The need for standards has also been identified in parallel activities (ie. AATGG Data Standards Working Group). This use case, then, should be the highest priority for implementation and testing in future phases of the project.

The direct roles for the AASF Data Ecosystem in supporting this use case are:

- Provide a mechanism *to enable the collaborative process of defining data standards and associated elements*, as well as supporting adoption and ongoing use of standards
- Provide a mechanism for *governance and administration of national scale data standards* developed under the auspices of the AASF Data Ecosystem. This includes:
 - Agreeing on what needs to be standardised (includes: measures, vocabularies, identifiers)
 - Identifying and/or developing candidate standards
 - Defining decision-making and governance for the standards
 - Adopting/endorsing standards for use within the community; and
 - Managing and evolving the standards portfolio as needs and opportunities arise.
- Encouraging the development and implementation of mechanisms to support the *registration and discovery of, and permissioned access to, organisational sustainability data*
- *Developing and implementing industry wide identity schemes* across key aspects of agricultural supply chains that support National Sustainability Data Standards

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards and identifiers		✓	✓

Use Case 2.1 – Trace sustainability credentials along supply chains



Primary Users

Supply chain actors (retailers, financier, exporters, FMCGs)

Use Case Objective

Users seek to understand and track the sustainability credentials of a product or products that has traversed part, or all, of a supply chain. This might be to support sustainability reporting or to meet export regulatory requirements.

Use Case Details

Tasks for this use case include:

- The primary user accessing relevant aggregated sustainability credential or product data along the traced supply chain
- Using this data to gain insight or understand product(s) of interest
- Utilising this data in report or regulatory requirements

Note: Where the user does not have permission to access certain data, they will be unable to access that data until permission has been sought and received.

Other stakeholders

- Ag Tech companies - who are looking to implement standards and/or developing application/tools to support participation in the use case.
- Data owners and custodians - Producers and processors along supply chains who need to supply data to support the use case.
- Regulators and certifiers – who require or determine credentials

Dependencies/Constraints

- Data owners along the supply chain are willing to /able to share their sustainability credentials
- There is agreement on the data that is needed to support the use case
- There are standards adopted across the industry to support data sharing
- There are stable and agreed identifiers for entities along the supply chain.

Commentary

There are currently numerous privately and publicly funded activities addressing aspects of this use case. DAFF has funded nearly 30 such projects over recent years (focusing on the concept of traceability). Solutions in this space are likely to be commodity specific and potentially specific to individual supply chains. A ‘one size fits all’ solution is not likely to be useful. Further, the AASF Data Ecosystem is not the appropriate venue to host and govern the development/implementation of industry specific supply chains solutions, although it may add value across industries.

The AASF Data Ecosystem can still have an important role in supporting this use case through:

- Providing a *collaborative space or mechanisms for stakeholders* in supply chains to make determinations on sustainability and traceability standards around data interoperability and traceability metrics
- Providing a *venue for stakeholders in supply chains to engage on key issues* relating to tracing sustainability credentials (for example, privacy concerns).
- Developing and *implementing industry wide identity schemes* across key aspects of agricultural supply chains to which traceability and sustainability data can be attached. For example, common managed identifiers for agricultural properties
- Providing a mechanism for *governance and administration of traceability standards and identifiers* developed under the auspices of the AASF Data Ecosystem
- Encouraging the *development and implementation of mechanisms to support the registration and discovery of, and permissioned access to, organisational sustainability and traceability data*

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C3: Collaborative mechanisms or spaces discussion and negotiation of use case specific issues (e.g. supply chain and traceability related)		✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards and identifiers		✓	✓

Use Case 3.1 – Create Corporate Sustainability Report



Primary User

Sustainability report developer (e.g. retailer, FMCG, bank)

Use Case Objective

Users seek to report upon corporate sustainability credentials of entities within the agriculture supply chain. This might focus on one entity or organisation, or a portfolio of entities (such as in the case of corporations with multiple holdings).

Use Case Details

Tasks for this use case include:

- Identifying required sustainability data
- Accessing data on one or more clients along the supply chain
- Producing a report that meets appropriate reporting standards

Other stakeholders

- Ag Tech companies – who might possess data
- Data owners and custodians - Producers and processors along supply chains or within portfolios who have data
- Account and sustainability reporting entities – who set disclosure and reporting requirements

Dependencies/Constraints

- Assumes a level of digital literacy that not all will have
- Assumes data is available in a way that meets reporting requirements
- Assumes that primary user will see value/benefit/need in assessing sustainability of their property
- Assumes availability of tools/methods for measuring/calculating chosen indicators
- Assumes stakeholders consent to sharing of data

Commentary

This use case is similar to Use Case 2.1, although the focus is on generating sustainability reports specific to an organisation or corporate entity. Thus, required sustainability data might be related to a specific supply chain or a portfolio of clients. As with Use Case 2.1, it is unlikely a “one size fits all” solution will be useful to enable this use case.

The AASF Data Ecosystem can still have a role in supporting this use case through:

- Provide a *collaborative space or mechanisms for stakeholders* to develop, implement, and manage sustainability data standards (including data interoperability and data quality) and their key qualities (i.e. what is being reported)
- *Developing, managing, publishing and providing support for use of standard identification schemes* across keys aspects of agricultural supply chains to which data can be attached. For example, common managed identifiers for agricultural properties.
- Providing a forum for *governance and administration of data standards*. This might include determining rules, expectations and policies around standards and sustainability reporting, data requirements, data licencing, data custodian ship, and key policy elements (e.g. privacy)
- Incentivising the development of *mechanisms to support registration and discovery of, and permissioned access to, organisational sustainability data*. This includes policies, incentives (if resources are available and possible), and/or collective undertakings and social agreements on this

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards		✓	✓

Use Case 4.1 – Assess client sustainability credentials

Primary User

Corporate client manager

Use Case Objective

Users seek to understand the sustainability credentials of a client to assess an application of some form. This might be for finance or similar.

Use Case Details

Tasks for this use case include:

- Accessing appropriate sustainability data concerning an individual client
- Generating a report that is fit-for-purpose
- If data is unavailable, or inaccessible (due to privacy reasons, for example), they will need to seek and receive permission to access

Other stakeholders

- Ag Tech companies – who might provide data
- Data owners (Clients) – who have data necessary for assessment
- Sustainability credentialing entities – who determine credential guidelines
- Entities with an interest in reporting on sustainability credentials (e.g. financial institutions or government agencies) – who set the circumstances and context of reporting conducted by the user

Dependencies/Constraints

- Assumes a level of digital literacy that not all may have
- Assumes data is available in a way that meets reporting requirements
- Assumes that primary user will see value/benefit/need in assessing sustainability of their property
- Assumes availability of tools/methods for measuring/calculating chosen indicators
- Assumes stakeholders consent to sharing of data

Commentary

This use case is similar to Use Case 3.1 however here the focus is on the sustainability credentials of an individual organisation rather than a group of organisations. Once again, solutions in this space are likely to be commodity, supply chains and/or portfolio specific.

Given the similarity to Use Case 3.1, recommendations and commentary on potential roles for the AASF Data Ecosystem identified in 3.1 are relevant here. In addition to these, the AASF Data Ecosystem might also have a role in:

- Providing a space for collaborative mechanisms or spaces discussion and negotiation regarding issues specific to access to an individual organisation’s sustainability data, such as social licence to operate or privacy.

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C3: Collaborative mechanisms or spaces for discussion and negotiation of use case specific issues		✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards		✓	✓

Use Case 5.1 – Benchmark sustainability credentials

Primary Users

Individual supply chain actors, e.g. primary producer or retailer

Use Case Objective

Users seek to conduct benchmarking to understand the current sustainability credentials of their organisation in the context of their industry peers. This may be for reporting purposes or to identify where improvements within their organisation might be made.

Use Case Details

Tasks for this use case include:

- The user discovers and accesses sustainability information that they can use to benchmark themselves against relevant peers
- The user conducts analysis based on this benchmarking to better understand the status of their sustainability credentials, in relation to their context and needs.

Other stakeholders

- Data aggregators – who provide the data necessary for benchmarking
- Industry groups – who desire information on sustainability credentials across supply chains and potentially set benchmarks
- Ag Tech sector – who develop tools and implement standards
- Industry peers – who the user is benchmarking themselves against

Dependencies/Constraints

- Assumes the availability of industry benchmark data, the ability to generate it, and ability to aggregate this data.
- Assumes there is a compelling need for benchmarking and sustainability credentials amongst stakeholders; this includes the existence and acceptance of credentials
- Assumes a tool/platform to access and analyse benchmarking data in a meaningful way

Commentary

The ability for organisations to understand how they compare to their peers can be useful for a range of reasons including helping drive innovation and the desire to improve.

As with previous use cases, the direct roles for the AASF Data Ecosystem in supporting this use case are:

- Provide a mechanism *to enable the collaborative process of defining data standards*, data requirements, and data ownership/licencing/custodianship arrangements required to support benchmarking of sustainability credentials, as well as supporting adoption and ongoing use
- Provide a mechanism for *governance and administration of sustainability credentials sets* developed under the auspices of the AASF Data Ecosystem.
- *Developing and implementing industry wide identity schemes* across key aspects of agricultural supply chains that support benchmarking of sustainability credentials
- Incentivising the development of *mechanisms to support registration and discovery of, and permissioned access to, organisational sustainability data*. This includes policies, incentives (if resources are available and possible), and/or collective undertakings and social agreements on this
- Incentivising the generation of advice, guidance and best practice to support this use case; for example, provide best practice advice on collaborating and generating mutually beneficial benchmarking activities

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards		✓	✓
C8: Advice, guidance, best practice that supports the realisation of use cases			✓

Use Case 6.1 – Access subsetted aggregated sustainability data

Primary Users

Researchers, program managers, policy development officers

Use Case Objective

Users are undertaking some activity for which they require a subset of aggregated sustainability data. This may be to support policy development, undertake a research project, develop local/regional benchmark information, monitor programme outcomes or similar.

Use Case Details

Tasks for this use case include:

- Discovering appropriately subtable aggregated sustainability data
- Accessing appropriately subtable aggregated sustainability data
- Completing required task with fit-for-purpose data.

Other stakeholders

- Data Owners – who provide data for aggregation
- Ag Tech sector – who provide tools for data aggregation
- Data aggregators – who offer services (whether they be data collection or analysis) around aggregation

Dependencies/Constraints

- Assumes that input sustainability data is available and is subtable along required dimensions – this might include location/region, indicator, and commodity, as determined by a user's specific needs
- Assumes data can be aggregated in non-identifiable ways, and that individual and organisational identities are protected, especially when there are potential disbenefits

Commentary

This use case combines elements seen in earlier use cases around the discovery of sustainability data and use for some purpose (such as Use Cases 3.1 and 5.1). In this way, recommendations and commentary for these earlier use cases are relevant here.

The distinct feature of this use case is the need to be able to subset aggregated data using specific dimensions of interest for users and stakeholders. Access and analysis of this data can be a source of great value for users, stakeholders and the broader community, but also potentially contentious given the specificity of the subset.

The direct roles for the AASF Data Ecosystem in supporting this use case are:

- Ensure that *data standards for sustainability data support the subset* use case
- Incentivising the *development of mechanisms to support registration and discovery of, and permissioned access to, organisational sustainability data.*
- *Incentivising the development of data aggregation and publication capabilities/services*
- Establishing *community supported guidelines for the appropriate collection and use of aggregated data*, defining expectations around privacy, (dis)benefits and other issues

Data Ecosystem Component	Infrastructure	Governance	Practice
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components		✓	✓
C8: Advice, guidance, best practice that supports the realisation of use cases (Data aggregation guidelines)		✓	✓
C9: Incentivising development of data aggregation and publication capabilities/services	✓	✓	✓
C10: Data standards that support subsetting	✓	✓	✓

Use Case 7.1 – Assess farm sustainability

Primary Users

Those responsible for farm sustainability

Use Case Objective

The user seeks to understand the current sustainability credentials for the property (farm) they are responsible for. This may be for a range of purposes including reporting, internal research and development, or other unspecified reasons.

Use Case Details

Tasks for this use case include:

- Finding and accessing information on relevant sustainability indicators within the context of the farm (may include benchmark data)
- Finding and accessing tools that will enable/support the user to measure relevant indicators and assess farm sustainability
- Using these tools to measure relevant indicators and generate farm sustainability assessment.

Other stakeholders

- Data developers and aggregators – who create sustainability data sets and data tools
- Companies with sustainability supply chains – who request sustainability information
- Ag Tech companies – that produce sustainability assessment tools

Dependencies/Constraints

- Assumes a level of digital literacy that not all users will have
- Assumes that primary user will see value/benefit/need in assessing sustainability of their property
- Assumes availability of tools/methods for measuring/calculating chosen indicators
- Assumes availability of data that can fulfill a user’s needs and context

Commentary

This use case focuses on individual producers/farmers and reflects that much of the burden of sustainability data collection and reporting rests with this group. As such, they need to be supported to be able to collect, analyse and report required data, and realise value in doing so.

The direct roles for the AASF Data Ecosystem in supporting this use case are:

- Provide a mechanism *to enable the collaborative process of defining data standards*, data requirements, and data ownership/licencing/custodianship arrangements required to support assessment of sustainability credentials
- Incentivising the *development of mechanisms to support registration and discovery of, and permissioned access to, organisational sustainability data*.
- Support users to *discover and access relevant data and standards* for identifying appropriate sustainability indicators, and successfully use in assessment. This may be directly via the provision of searchable online repositories or indirectly through connecting users with appropriate sources.
- Provide an ability for users to find and access tools and guidance that support calculation/measurement and reporting of indicators
- Provide a space for third-party tool and information providers to register and publish their tools/advice.
- Provide a mechanism for *governance and administration of sustainability credentials sets* developed under the auspices of the AASF Data Ecosystem.

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components (e.g. sustainability data)	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards		✓	✓
C8: Advice, guidance, best practice that supports the realisation of use cases (e.g. where to find and access tools, knowledge, tools, expertise and indicators supporting farm sustainability)	✓		✓
C11: Space for third parties publish their tools/supports	✓	✓	✓

Use Case 7.2 – Improve farm sustainability

Primary Users

Those responsible for farm sustainability

Use Case Objective

The user seeks to improve aspects of the sustainability of the property (farm) they are responsible for. They might be a farm owner, a sustainability officer or resource manager, or another professional based at this specific organisation.

Use Case Details

Tasks for this use case include:

- Identifying and accessing knowledge and tools of relevance to their context
- Conducting analysis on this data that aligns with their needs – this may include benchmarking against their peers (see use case 5.1)
- Implementing actions to improve sustainability based of this analysis

Other stakeholders

- Data developers and aggregators – who create sustainability data sets and data tools
- Other farms – who might be benchmarked against
- Stakeholders in specific farms – who might receive a benefit from improved farm sustainability

Dependencies/Constraints

- Assumes a level of digital literacy that not all users will have
- Assumes that primary user will see value/benefit/need in assessing sustainability of their property
- Assumes availability of tools/methods for measuring/calculating chosen indicators
- Assumes availability of data that can fulfill a user's needs and context
- Assumes users can translate data into actions to support their context

Commentary

This use case is related to Use Case 7.1 and has cross-over with Use Case 5.1. It focuses on individual producers/farmers, and their need to be supported to be able to achieve required/desired sustainability outcomes.

Roles identified for the AASF Data Ecosystem in 7.1 (especially technical roles) remain relevant and should be considered here. Further, the potential for benchmarking to support this use case means use case 5.1 is also relevant here.

Additionally, additional direct roles for the AASF Data Ecosystem in this use case are:

- To support users in finding advice and tools for:
 - improving operational sustainability
 - translating sustainability knowledge and analysis into implementable action

Data Ecosystem Component	Infrastructure	Governance	Practice
C2: Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓
C4: Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)	✓	✓	✓
C5: Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components (e.g. sustainability data)	✓	✓	✓
C6: Rules, policies, and governance mechanisms for data standards		✓	✓
C8: Advice, guidance, best practice that supports the realisation of use cases (e.g. advice to improve operational sustainability and translate sustainability knowledge into action)		✓	✓
C11: Space for third parties publish their tools/supports	✓	✓	✓

Data ecosystem components by use case

		UC 1.1	UC 1.2	UC 2.1	UC 3.1	UC 4.1	UC 5.1	UC 6.1	UC 7.1	UC 7.2
C1	Collaborative mechanisms or spaces for development, implementation, and management of data sets	✓								
C2	Collaborative mechanisms or spaces for development, implementation, and management of data standards	✓	✓	✓	✓	✓	✓	✓	✓	
C3	Collaborative mechanisms or spaces discussion and negotiation of use case specific issues			✓		✓				
C4	Mechanisms for development, implementation, and management of industry wide identifiers schemes (as applicable to the use case)		✓	✓	✓	✓	✓			
C5	Discovery, registration, or access mechanisms for data, standards, or other use case relevant data/technical components		✓	✓	✓	✓	✓	✓	✓	
C6	Rules, policies, and governance mechanisms for data standards	✓	✓	✓	✓	✓			✓	
C7	Rules, policies, and governance mechanisms for data sets	✓								
C8	Advice, guidance, best practice that supports the realisation of use cases						✓	✓	✓	✓
C9	Incentivising development of data aggregation and publication capabilities/services						✓	✓		
C10	Data standards that support subsetting							✓		
C11	Space for third parties to publish tools and supports materials								✓	

Common Data Ecosystem Components

In addition to the use case specific components identified on the previous page, the analysis identified common components that underpin all use cases. These components can be considered as essential prerequisites; no use case can realise its potential and create value without addressing these and could potentially jeopardise the success of the AASF Data Ecosystem if not adequately considered.

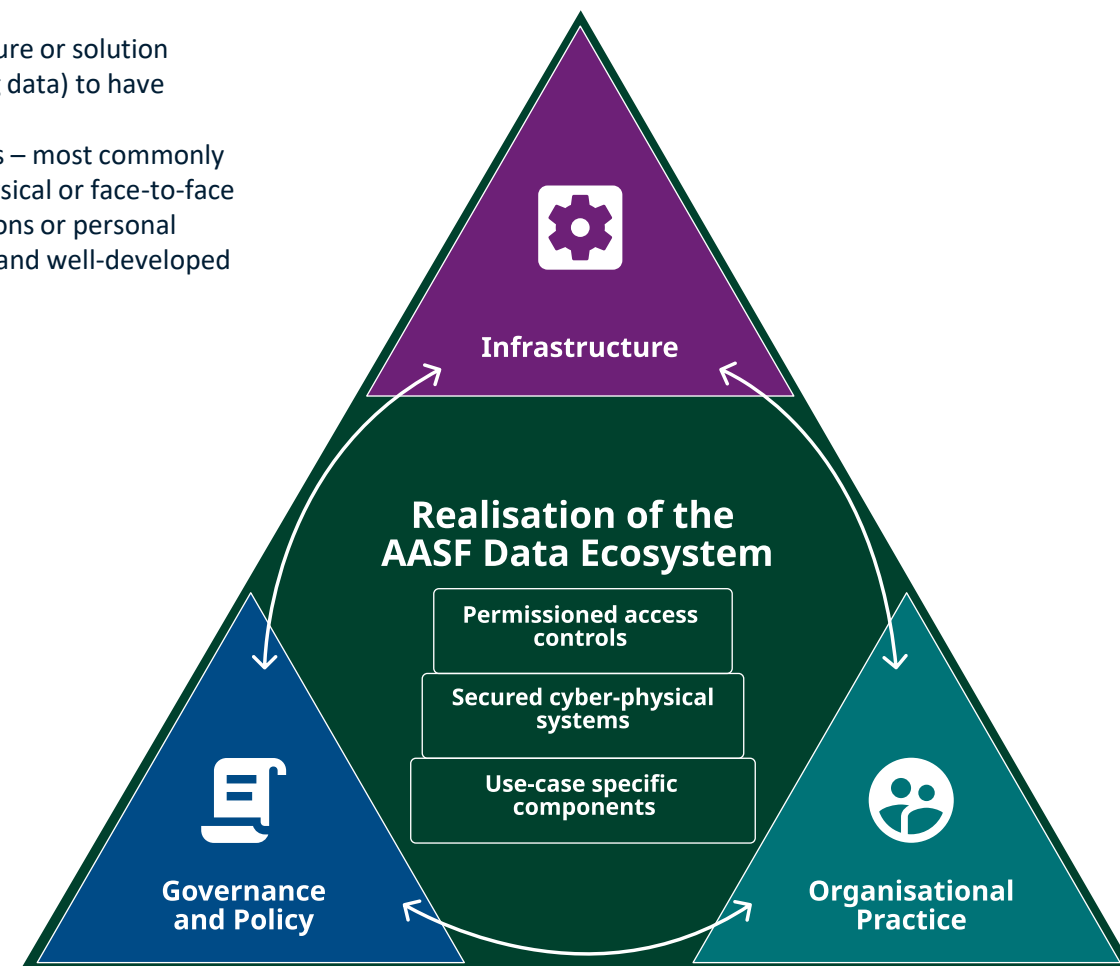
Shared components identified are:

- *Permissioned access controls for sensitive (commercial or personally identifiable data)* – Any infrastructure or solution within the context of the AASF Data Ecosystem must allow stakeholders (particularly those contributing data) to have appropriate access controls in place to manage access to sensitive, but valuable, forms of data.
- *Secured cyber-physical systems* – All use cases must be resilient and secured against cyber-physical risks – most commonly cybersecurity risks like (but not limited to) hacking. Note that many cybersecurity risks incorporate physical or face-to-face elements and are not wholly digital (e.g. so-called “social engineering” attacks, that utilise social situations or personal relationships to gain unauthorised access). Thus, in securing the AASF Data Ecosystem, a wide-ranging and well-developed conceptualisation of risks and responses must be adopted to address these concerns

A socio-technical approach to AASF and AASF Use Cases

As with all components within the AASF Data Ecosystem and Use Cases, the above common components must be understood as socio-technical – requiring and being comprised of both technical *and* social/human elements and relationships and resources.

A failure to appreciate and build the AASF Data Ecosystem in a socio-technical way (e.g. focusing on procurement of technical infrastructure without understanding the human actors and institutions who wish to use it) will result in (at best) a data ecosystem that only partially provides value to stakeholders, or (at worst) a failed system.



4.0 Summary and Next Steps

Workshop Reflections and Lessons Learned

Running the workshop, and the deployment of novel tools like the DataCity 2030 game, provide opportunities for reflections and insights that further strengthen the outputs from this and future workshops, and the overall rigour of the team's work. The following reflections and lessons learned are noted as opportunities for growth and improvement, and are presented as “how might we” questions to inspire future actions

How might we...

... Further develop the DataCity 2030 Approach?

The workshop's opening instrument: the DataCity 2030 game – represents an original approach for co-design of data ecosystems. While there are precedents for the use of gamified, co-productive approaches to data collection and system design¹, there is an inherent degree of indeterminacy to the quality of this tool, given its novel status. As a data collection tool for data ecosystem designs, there is a further opportunity to check the:

- validity (i.e. does the tool capture what it proposes it does),
- sensitivity (i.e. does the tool capture all relevant information), and
- specificity (i.e. does the tool accurately exclude false or irrelevant information that might falsely contribute to results)

of this tool in future iterations.

Assessment against these metrics (which are usually applied to psychological or medical tests) is not necessary or required, as the tool is used for co-production and elicitation rather than diagnosis and has already demonstrated its ability to elicit relevant qualitative information. However, in the interests of having the best, most relevant, and most appropriate tools to deliver to client needs, considering these issues and iterating versions that strengthen these qualities may prove useful.

... Improve engagement with our tools and methods?

During the analysis of outputs from the workshop, some interesting variations in what was being included in the use cases was noted. Some described circumstances preceding or contingent for the creation of the use case, rather than speaking directly to the use case itself. This brought into question whether participants were properly briefed on the task, and whether the tool was functioning as effectively as hoped.

Future iterations of the tools and methods should consider participants' experience of the tool and ensure this is positive and supportive.

... Better structure workshops to maximise their value?

The initial workshop planning called for the playing of the DataCity 2030 game, identification of use cases followed by development of 2 use cases per table and then discussions and development of visions, objectives and principles for the data ecosystem. Our observation is that the running and playing of the game took longer than expected and required more attentional energy than anticipated from participants. We may have been over-ambitious in also attempting to address visions and principles for the ecosystem in the same workshop. In future, when time limited, we may focus on either the game, or vision and principle building activities, and run separate workshops rather than combining them.

1. Bayrak, A. T. (2019). Games as a Catalyst for Design for Social Innovation. Unlocking legendary tools. *The Design Journal*, 22(sup1), 1409-1422.

Vision, Objectives and Principles

A key output from the workshop were proposed vision statement, objectives and principles for the AASF Data Ecosystem

Vision

“Empowering Australian agriculture through a trusted, interoperable data ecosystem that ensures informed decision making, fosters continuous improvement, collaboration, and creates enduring benefit for the entire agricultural value chain”

Objectives

- Improved collaboration, cooperation, and coordination
- Reduce the burden on data owners
- Improved interoperability and usefulness
- Improved availability and access
- Improved reliability/trustworthiness
- Increased investment
- Increased uptake and use of sustainability data

Principles

- Findable, Accessible, Interoperable, Reusable (FAIR)
- Secure
- Usable
- Accessible
- Equitable and ethical
- Privacy by design
- Integrity
- Value additive

Next Steps

Each of these artefacts need to be reviewed by the AASF Community of Practice to ensure they meet expectations. Then, once governance of the AASF Data Ecosystem is operationalised, they should be adopted as primary artefacts of the community.

Use Cases and Required Data Ecosystem Components

The major output from the workshop and subsequent analysis is the 9 AASF Data Ecosystem Use Cases and the various components that the data ecosystem will need to include to enable the data ecosystem support these use cases.

Use Cases

- 1.1 - Develop National Scale Sustainability Data
- 1.2 - Develop National Sustainability Data Standards
- 2.1 - Trace Sustainability Credentials Along a Supply Chain
- 3.1 - Create Corporate Sustainability Report
- 4.1 - Assess Client Sustainability Credentials
- 5.1 - Benchmark Sustainability Credentials
- 6.1 - Access Subsetted Aggregated Sustainability Data
- 7.1 - Assess farm sustainability
- 7.2 - Improve farm sustainability

Ecosystem components

- C1 - Collaborative mechanisms or spaces for development, implementation, and management of data sets
- C2 - Collaborative mechanisms or spaces for development, implementation, and management of data standards
- C3 - Collaborative mechanisms or spaces discussion and negotiation of use case specific issues
- C4 - Mechanisms for development, implementation, and management of industry wide identifiers schemes
- C5 - Discovery, registration, or access mechanisms for data, standards, or other use case relevant
- C6 - Rules, policies, and governance mechanisms for data standards
- C7 - Rules, policies, and governance mechanisms for data sets
- C8 - Advice, guidance, best practice that supports the realisation of use cases
- C9 - Incentivising development of data aggregation and publication capabilities/services
- C10 - Data standards that support subsetting
- C11 - Space for third parties to publish tools and supports materials

Next Steps

The next phase of this project will design and prototype key enabling ecosystem components needed to support the high priority use cases for the AASF Data Ecosystem. Therefore, the next step in the project is to identify those high priority use cases and, from there, the components to be prototypes. Given the outputs of Use Case 1.2 underpin all other use cases, it is highly recommended that this be included as one of the high priority use cases.

Use Case 1.1 is of importance to other activities within the broader AASF program and so also is recommended as high priority.

The remaining three high priority use cases are to be identified by the client.



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

CSIRO. Unlocking a better future for everyone.

Contact us

1300 363 400
+61 3 9545 2176
csiro.au/contact

For further information

Environment Business Unit:

David Lemon
+61 2 6246 5724
David.Lemon@csiro.au