Drought and climate adaptation program

DCAP3

CREATING ALTERNATE INCOME STREAMS TO INCREASE FARM PROFITABILITY AND BENEFIT THE ENVIRONMENT (UNISQ)

MILESTONE 2B REPORT

Drought and climate adaptation program

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Options and cautions: Environmental credits, practice, and payments for QLD land managers

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Acknowledgement of Country:

The University of Southern Queensland acknowledges the Country and traditional custodians of the lands and waterways where the University is located. Further, we acknowledge the cultural diversity of Aboriginal and Torres Strait Islander peoples and pay respect to Elders past, present and future.

We celebrate the continuous living cultures of First Australians and acknowledge the important contributions Aboriginal and Torres Strait Islander people have and continue to make in Australian society.

The University respects and acknowledges our Aboriginal and Torres Strait Islander students, staff, Elders and visitors who come from many nations.

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1 Introduction

Payments for ecosystem services have the potential to generate income for agricultural producers and land managers in QLD.

Currently in Australia, there is significant investment aimed at developing a range of new financial (market-based) mechanisms to support (and pay land managers for) the delivery of environmental outcomes on private (mostly agricultural) lands (e.g., 'Agriculture Biodiversity Stewardship – Carbon + Biodiversity Pilot'). Such programs can provide income diversification opportunities for agricultural producers and land managers. For example, the existing Australian 'Savanna fire management - emissions avoidance' program, designed to mitigate carbon emissions from hot dry season fires, has created a A$20 million a year industry for land managers (Fitch, et al., 2022).

Land managers need to understand the net benefits and risks (including trade-offs) of participation in such programs, especially where there are permanence obligations that require the outcomes delivered to be maintained for a specified period. For example, the Emissions Reduction Fund requires carbon sequestration projects to choose a permanence period of either 25 or 100 years (ERF, 2020). This points to potential risk to participants, risk that is increased where climate variability plays a significant role in land-based carbon storage/emission dynamics and penalties apply for non-delivery of contracted outcomes.

There is also potential to lose income through failure to respond to new expectations from buyers of agricultural commodities. Those expectations include providing evidence of improvement against baseline impact on climate and nature. Land managers may be reluctant to disclose a low baseline or specific impacts, however, somewhat perversely, a farming operation that has a low starting point can generate more income from credits. There is a window of time where improvement from a low baseline may still satisfy buyers that a product is sustainable.

Future expectations will centre on net zero, net positive and nature positive. In anticipation of this, there has been many marketing catch phrases that aim to show products in a sustainable light, but consumers and governments alike have taken a dim view of sustainability claims with no solid, transparent evidence (ASIC, 2023). These claims have been termed 'greenwashing' and in Australia fines have been applied for this practice (KPMG, 2023).

New national and international frameworks are aimed confirming standard metrics that all companies will use to measure and make sustainability claims. Some of these will become mandatory in Australia by 2024. This report will work through a summary of frameworks that create payments for ecosystem services, how these may impact on market access and what specific practices are being expected of land managers.

2 About payments for ecosystem services

The focus of this report is current programs that deliver payments for ecosystem services (PES) in Australia. These programs are aimed at meeting our obligations towards key international frameworks: the Paris Agreement (UNFCCC, no date), the Sustainable Development Goals (UN DESA, 2023) and the Global Biodiversity Framework (UNEP, 2022), to which Australia is a signatory. These

frameworks are the principal drivers behind Australia's 2022 revised commitments and associated enabling legislation (DFAT, no date) to:

- reduce greenhouse gas emissions by 43 per cent below 2005 levels by 2030; and
- protect and conserve 30% of land and sea areas by 2030 (or DFAT ref here).

The discussion below looks first at international regulations and programs relevant to the Australian context, followed by programs currently operating and in development in Australia.

2.1 International regulations on clearing and emissions

Carbon cap and trade **compliance** markets are expanding across the world. As such, there are increasing compliance requirements pending for Australia around climate and nature impact reduction. Such markets already operate in Europe, Asia, Mexico and a number of American states (ICAP, 2022); other such markets are under development in South America and Oceania (ICAP, 2022). Alignment of the Australian carbon market with those of trading partners such as Europe, the United States, New Zealand, Japan and South Korea to allow trading of defined credits under their frameworks (Wood, 2023) would be beneficial and support trading of carbon credits at potentially higher prices.

The European Union (EU) has taken an extra step, beyond emissions reduction, to prevent deforestation. From 29 June 2023, the EU will only sell or export products that are proven to be 'deforestation free'. The consequences of non-compliance for EU companies will include fines of up to 4% of turnover and confiscation of non-compliant products (Mackay, et al., 2023). This policy is already impacting on market access for Australian agricultural products, as will be discussed in Section 3 of this report.

2.2 International PES programs

There are three international programs currently applied in Australia: Gold Standard for Global Goals; Regen Network and VERRA

The Gold Standard for Global Goals is aimed at defining high quality climate and environmental projects. These are projects that are identified as achieving the Paris Agreement Targets and Sustainable Development Goals. Gold Standard certified projects apply robust monitoring, reporting and verification processes. There is currently one Australian based Gold Standard project. This project is being run by Carbon Neutral and expects to sequester 1.059M tonnes of CO2-e over fifty years (carbonneutral, 2023). Their design and impact certification processes use remote sensing and satellite imagery to keep monitoring costs low (Gold Standard, 2023). Gold Standard are also using blockchain technology to automate impact certification where possible. Such automated certification systems, while logistically expedient, may still require verification, especially for Australian conditions, as in the example below.

Regen Network is an American blockchain specialist company that has moved into verifying environmental credits that has facilitated soil carbon offset transactions between Microsoft and grazing properties in New South Wales (The Conversation, 2021), (Wilmot Cattle Company, 2021);

however, the validity of the volume of credits in this transaction have been questioned (The Conversation, 2021). The concern is that the method was not appropriately applied and the estimated carbon sequestration potential used is far higher than that previously indicated for Australian soils (Sanderman, et al., 2010) (Fitch, et al., 2022). Specifically, the Regen Network method indicated just over 26 tonnes CO2-e per hectare per year (Booman, et al., 2019) while the most recent CSIRO report indicates between 0.18 and 2.9 t CO2-e per hectare per year (Fitch, et al., 2022). Responses from both Regen Network (Booman, et al., 2020) and Wilmot Cattle Company (The Conversation, 2021) acknowledge that they expect to continue to refine their soil carbon estimation and measurement as the technology improves.

Learning and new technologies are also contributing to the development of new types of international environmental market products such as the VERRA Plastic Credits. VERRA is another international, US-based non-profit company providing a voluntary carbon market platform along with a range of other environmental and sustainability related standards (VERRA, 2022). One of these, the VERRA Plastic Waste Reduction Program, issued 32 Waste Collection Credits (WCC) to North QLD banana farms for waste collected for the year ending August 2021 (VERRA, 2023). However, like Regen Network (and the Australian Emissions Reduction Fund (ERF), as shown later in this report), VERRA has faced scrutiny and criticism of one of their environmental standards. The VERRA rainforest standard is being voluntarily withdrawn from the market with concerns that up to 90% of the credits issued are not achieving actual carbon reductions (Weston & Greenfield, 2023).

While some internationally developed environmental market products are applicable to Australian situations (e.g., VERRA Plastics Credits), there are some cautions to be aware of:

- Is the method valid for Australian conditions? (e.g., the Regen Network Soil Carbon method)
- Is the method of good repute and does it stand up to robust questioning? (e.g., the VERRA Rainforest Credits).
- Are the credits recognised in the Australian Market? Note that the VERRA and Gold Standard Vegetation method credits are not, because they use satellite imagery estimates of sequestration and this is already counted against Australia's Paris Agreement commitment (Wood, 2023).

2.3 Australian Carbon Credit Units

As with the international examples already described, there are many defined methods for recognizing carbon sequestration and reduction as Australian Carbon Credit Units (ACCUs). Here, the methods most relevant to agriculture will be summarized with the content substantially taken from (Fitch, et al., 2022). Note that Human Induced Regeneration (HIR), Native Forest from Managed Regrowth (NFMR) and Feeding Dietary Additives to Milking Cows (Dairy method) methods are not described here as these methods will be discontinued as of 30 Sept 2023 (DCCEEW, 2023). Elements of these methods will be included in a new Integrated Farm and Land Management method, currently under development (DCCEEW, 2023). Table 1 shows a comparison of methods using million tonnes (Mt) traded, technical and economic potential volumes and estimate of cost per tonne to generate. Cost per tonne may be compared to the most recently published ACCU auction average

price of $17.12 per tonne (ERF, 2023). Further details on practices involved with these methods will be provided in Section 4 of this report.

Table 2: Summary of stats for ACCU methods (Source: (DCCEEW, 2023))

Method	Actual (ERF) Mt* CO2-e	Technical Potential Mt CO2-e per year	Economic Potential Mt CO2-e per year	Cost per tonne ($)
Permanent Plantings (per year 2010-2020)	2.1	Approx. 480	Approx. 16	20 - 30
Plantation and Farm Forestry (per year 2010-2020)	11.5	630 (42)	Approx. 32 (0.63)	10 - 30
Avoided Land Clearing	Unknown	9.2	7.7	5 - 10
Soil Carbon 2021-2022	0	115	5-29	7 - 13
Pyrolysis Biochar Systems (2021-22)	0.04	30-60	Unknown	82 - 119
Bioenergy with Carbon Capture and Storage	1.7	227 Gt/year	24	~20

*million tonnes

2.4 Safeguard mechanism

The Australian Safeguard mechanism provides a source of private (non-government) demand for ACCUs that might be filled by agricultural businesses. Australia has committed to 'emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050' (DCCEEW, 2023). The Safeguard mechanism has translated these targets into emissions reduction baselines and incremental annual reduction of 4.9% per year (to 2030) for Australia's largest emitters (DCCEEW, 2023). Under the Safeguard mechanism, from 1 July 2023 Australian companies emitting greater than 100,000 tonnes CO2e per year have access to a new incentive to reduce their emissions beyond existing requirements (DCCEEW, 2023). Annual data on these companies is provided by the Clean Energy Regulator and a list of the companies involved is provided at Appendix A: Emitters falling under the Australian Safeguard mechanism – 2021-22. These companies can generate and trade Safeguard Mechanism Credits (SMCs) amongst themselves if they reduce emissions at a faster rate than required (DCCEEW, 2023). Individual facilities under the safeguard requirements can also purchase ACCUs to offset up to 30% of their reduction target each year (DCCEEW, 2023), with a requirement to explain why they've invested in offsets rather than abatement if this is exceeded (DCCEEW, 2023).

2.5 Nature Repair Market in development

The Australian Government's proposed Nature Repair Market is not yet operating. The legislation that would enable this market to develop further has been passed by the House of Representatives (APH, no date) and is currently before the Senate awaiting a report, due on 1 November 2023, from the Environment and Communications Legislation Committee (APH, no date). Public consultation feedback has ranged from cautious optimism to highly critical (Gibson, 2023). Nature Repair projects will have a single tradable certificate that can be sold under a commercial contract (DCCEEW, 2023). Demand for Nature Repair projects may come from the new requirements of the Taskforce for Nature Related Financial Disclosures (DCCEEW, 2023), covered in Section 3.2. The QLD government has already moved ahead with a state-level framework that may be similar to what a Nature Repair Market Certification may require.

2.6 Queensland-based frameworks

A number of carbon and environmental services frameworks have also been developed and are operating in QLD, the most relevant of which are the Land Restoration Fund[1] and Reef Credits.

The QLD Government's Land Restoration Fund (LRF) pays land managers across the state for co-benefits when they change practices to sequester, or avoid releasing, carbon. Eligible co-benefits in addition to carbon reduction or sequestration include environmental, socio-economic and First Nations outcomes (Queensland Government, 2023). There is a large range of payments per hectare per year as indicated in Table 2. Environmental Plantings (with co-benefits) attract higher payments ranging from \$1,027 to \$9,659 $ha^{-1}yr^{-1}$ while lower rates of between \$47.93 and \$372.25 $ha^{-1}yr^{-1}$ apply to Avoided Clearing (with co-benefits).

Table 3: LRF range of $ per hectare per year for Round 1 and 2 Investments in relevant methods (Source: (Queensland Government, 2023))

Method	Highest $/hectare/year	Lowest $/hectare/year
Environmental plantings with co-benefits (5 projects)	9,659.26	1,027.34
Avoided clearing with co-benefits (3 projects)	372.25	47.93

Reef Credits are another QLD-based environmental market scheme with benefits for land managers operating in Reef catchments. Reef Credits are managed by Eco-Markets Australia, Australia's first independent environmental markets administrator (EcoMarkets Australia, 2023). A reef credit is a tradable unit of pollution reduction, or a measured amount of avoided nutrient, pesticide or sediment entering the drainage systems feeding into the Great Barrier Reef (EcoMarkets Australia, 2023). Across the project details disclosed on the public registry (EcoMarkets Australia, no date), there is an average of 2.1 to 19.69 credits per hectare per year for projects developed under the

[1] Note that Cassowary Credits are a branded trial with development supported by early phases of the LRF in 2019, these are not covered separately here but more information can be found: (Terrain, 2022)

dissolved inorganic nitrogen (DIN) Method (see below). The price for each credit currently ranges from $90 - $125 and is predicted to reach a range of $175 - $350 depending on the method and the buyer (Venz, 2023, p. pers coms). There are two credit options within Reef Credits methods:

- 1kg of dissolved inorganic nitrogen (DIN) prevented from entering the reef (Cooper, 2021)
  - DIN Method (Schultz & Sinclair, 2020)
  - Wastewater Method (Mulder & Neveux, 2023)
  - Wetlands Method – not yet approved, currently under review (Shoo, et al., 2022)

- 536kg of fine sediment prevented from entering the reef (Green Collar, 2023)
  - Gully Method (Brooks, et al., 2020)
  - Grazing land management Method – new method under public consultation until 5th Oct 2023 (Yates & Silverwood, 2023)

3 About market access for carbon neutral agricultural products

There are emerging challenges to market access for agricultural products entering international markets. Supply chain requirements and new mandatory financial disclosures, along with accusations of greenwashing, are increasing. Agricultural products are increasingly facing demands for net-zero and nature positive credentials. Examples of impacts from the EU 'de-forestation free' policy include:

- International remote catering company Compass Group Australia, who purchase 50,000 tonnes of fresh food annually, have taken beef off their menus to reduce their carbon footprint in service of a UK based Sustainability Bond investment (TSBE, 2023) (Compass Group, 2022).
- ALDI USA has told an Australian exporter that they would no longer buy QLD beef due to concerns about deforestation (TSBE, 2023) (ALDI, 2023)
- Cotton Australia has indicated that it will not support clearing for new cotton production post-2020 (TSBE, 2023) (Fitzgerald, 2023)
- A beef producer has reported that their shift into carbon farming was based on maintaining market access into Europe by providing evidence that they no longer clear mulga for fodder (pers. comms. Annon. 2021)

Due to significant 'greenwashing' across market supply chains, agricultural businesses will increasingly need robust evidence to demonstrate their actions to reduce the carbon emissions and nature impacts of their own products to remain competitive.

3.1 Greenwashing

As consumer demand for climate- and biodiversity-responsible products increases, there has also been an increase in concern about "greenwashing". Attention from the Australian Securities and Investment Commission (ASIC) is highly focused on any "net zero" type sustainability targets and

Australian companies have already experienced ASIC fines for greenwashing offenses (KPMG, 2023). One national response to this is coming from the Australian Institute of Company Directors (AICD).

In 2021, the AICD become Australia's host for the World Economic Forum's Climate Governance Initiative, with the stated aim to "embed climate considerations into Australian boardrooms' strategic decision making" (AICD, no date). AICD provides a range of information and tools to support company directors to avoid greenwashing and pursue due diligence in relation to changing requirements (AICD, no date). They also provide a range of forecasts on where public disclosure requirements are heading for Australian companies (AICD, 2023), including those related to the climate and nature impacts.

3.2 Financial disclosure requirements for climate and nature impacts

There is an international push to create consistent ways for companies to report on their carbon emissions and nature impacts. There are two taskforces in progress that will have implications for Australian agriculture: the Taskforce on Climate Related Financial Disclosures (TCFD) and the Taskforce on Nature Related Financial Disclosures (TNFD).

The Taskforce on Climate Related Financial Disclosures (TCFD) began at the global level and in the 2024-2025 financial year certain Australian companies will be required to publicly disclose their emissions (Kim, et al., 2023). The thresholds that define which companies are required to report will change over the three financial years from 2024-2025 to 2027-2028 (Kim, et al., 2023) such that:

- In 2024-25 reporting required from companies with more than 500 employees; greater than $1 billion of consolidated assets and greater than $500 million of consolidated revenue; and
- By 2027-28 reporting will be required from companies with more than 100 employees; greater than $25 million of consolidated assets and more than $50 million of consolidated revenue.

While these thresholds may be beyond many agricultural companies' operations, it must be understood that in the second year of reporting these large companies will have to report on their "Scope 3" emissions. Scope 1 emissions are directly from production processes and Scope 2 emissions are from the use of energy in production (NGER, 2023). These already have mandatory reporting requirements for Australian companies that exceed set emissions thresholds (NGER, 2023). Scope 3 emissions account for input materials, transportation and use of products (NGER, 2023). Agricultural businesses of all sizes will form part of the upstream and downstream value chain of companies with these new Scope 3 emissions reporting requirements. It would be proactive for agricultural business to define their own carbon emissions before the lack of this information impacts on their ability to sell their products.

Requirements for companies to disclose nature related impacts are coming fast behind climate disclosures and have the support of the Australian Government (DCCEEW, 2023). The international Taskforce on Nature-related Financial Disclosures (TNFD) released its final framework in September 2023 (DCCEEW, 2023) (TNFD, 2023) There is also an Australian Case Study Report that includes trial applications of the framework to the value chains of beef, salmon and cotton (Ernst & Young, 2023).

This framework has adopted many similar approaches to the TCFD including a nature version of "scopes" (TNFD, 2023) that covers:

- direct operations – impacts from storage and processing;
- upstream supply chain – impacts from suppliers and sourcing inputs;
- downstream supply chain – impacts from distribution and use of products; and
- finances – investing in, lending to or insurance of high emissions companies (Doshi, et al., 2021).

Table 3 details the expected climate disclosures and identifies alignments with the proposed nature disclosures, showing the subset of metrics specific to agricultural industries.

Table 4: Comparison of proposed financial disclosures between climate (TCFD) and nature (TNFD) taskforces

Disclosure	**TCFD***	**TNFD****
Greenhouse Gas Emissions, including CO2, CH4, N2O, by metric tons CO2-e	Yes	Yes
Energy management and fleet fuel by Gigajoules and % renewable	Yes	-
Water management by thousand cubic meters of water withdrawn and consumed with % of these sourced from regions with high or extremely high baseline water stress and number of non-compliance with permits	Yes	-
% of agricultural products or animal feed produced or sourced from regions with High or Extremely High Baseline Water Stress	Yes	Yes
Activities metrics including: • volume of production by crop • number of processing facilities • total land area under active production • cost of agricultural products sourced externally.	Yes	-
Agriculture driven terrestrial natural ecosystem conversion since 2020 in km2	-	Yes
Intensity of pesticides used by toxicity	-	Yes
Volume and intensity (by proportion of total cropland owned) of excess fertilizer released to soil water and air	-	Yes
Weight (tonnes) of food loss or waste by type of food, stage of value chain, and final disposal or reuse	-	Yes
Weight of plastic packaging used/sold, % raw material content and weight of classified problematic plastics	-	Yes
Concentration of key pollutants in wastewater discharged through operations	-	Yes

Disclosure	TCFD*	TNFD**
Emissions of nitrogen oxides (NOx), sulfur oxides (SOx), ammonia (NH3), particulate matter (PM10 and PM2.5), non-methane volatile organic compounds (NMVOCs)	-	Yes
% of agricultural products on the high impact commodity list (HICL) (Science Based Targets Network Global Commons Alliance, 2023) sourced, that are certified to a third-party environmental and/or social standard and percentages by standard	-	Yes

- Source: (IFRS, 2022)

** Source: (TNFD, 2023)

Within the same timeline as these international developments, Australian agricultural industry peak bodies have also been aligning, and simplifying, reporting frameworks for sustainability.

3.3 Voluntary sustainability reporting frameworks and targets across Australian industries

Due to the speed of change in the area of sustainability, the currency of reporting frameworks is critical. The Australian Agriculture Sustainability Framework (AASF) (AFI, no date) (McRobert, et al., 2022) was released in 2022 by the National Land managers Federation (NFF). It is hosted by the Australian Farm Institute and was developed through funding from the Australian government's Agricultural Biodiversity Stewardship Package. A useful background report on the future of sustainability requirements in Australian agriculture was prepared by KPMG for this NFF project (Poole, et al., 2022). Relevant conclusions from this report were:

1. Lack of farm gate data on sustainability is a barrier to responding to consumer-led sustainability expectations; and
2. Lack of a single definition of sustainability for Australian agriculture has propagated bespoke independent frameworks across the sector creating confusion and cost rather than adding value (also supported by (McRobert, et al., 2020).

The AASF is a good place for farming businesses to get started with sustainability reporting and targets. It has reviewed and reflects a large range of existing international and national frameworks that are relevant to agriculture and agricultural supply chains (Refer to Appendix B: Sustainability Frameworks reviewed in the preparation of the AASF).

3.4 Two examples from Beef producers

It is helpful to provide specific case studies of how agricultural companies are responding to the opportunities and challenges outlined so far in this report. The following describes two examples from the beef industry that were covered in this year's Agrifood Innovation Forum in Toowoomba, QLD (TSBE, 2023): Four Daughters and NAPCO.

Four Daughters is a family-owned beef production business exporting to China and Hong Kong from their properties in western QLD (Four Daughters, no date). Their key insights regarding baselining their operations for carbon and nature impacts (TSBE, 2023) include:

- Getting a baseline begins with confusion.
- Data gathering wasn't as onerous as we thought it would be.
- It was a 2-year process to baseline natural capital and then predict flows to generate a future positive or negative outcome based on business as usual.
- We have our 'number' but we are not sure what it means for us yet.
- Human Induced Regeneration **was** the most relevant carbon calculation method for our operations, and it is now sunsetting at the end of September 2023.
- We may still be able to go ahead with defining carbon credits through the Integrated Farm Management methodology that is currently under development.
- Having our baseline opens more questions than it answers.
- We originally aimed to **inset** against our own emissions and sell the excess but there doesn't look like there will be any excess to sell.
- We don't expect to see any premium price for our sustainable practices, but we are more certain about market access issues without them.
- The next generation's view of locking up country to carbon for 25 years is: it is not an option!

The North Australian Pastoral Company (NAPCo) launched the Five Founders Beef brand in April 2019 as Australia's first carbon neutral certified beef (NAP, no date). The key steps that enabled this bold claim were (Bell, 2019):

- Create a branded beef program which retains NAPCo ownership of the branded product range through the supply chain.
- Define the life cycle analysis (LCA) for a generic 20kg branded beef package using a hybrid input-output LCA method
- Define the certification boundary as cradle to gate - excluding by-products of slaughter and consumption phase emissions.
- Commit to emissions reduction actions including
    - replacing diesel bore pumps with solar;
    - increasing live weight gain through feed efficiency;
    - increasing water point density to increase grazing radius to reduce time to slaughter; and
    - using Bovaer ® supplement to reduce methane emissions from cattle herd (DSM, no date).

These examples provide some clues about the range of practices that land managers can choose to apply that may generate payments for ecosystem services. The next section provides more detail on the specific practices expected from the frameworks already described.

4 The change you make is all that matters.

All valid frameworks that establish payments for ecosystem services projects are based on a set of accepted principles (EcoMarkets Australia, 2021). They must be:

- Real – quantifiable and verifiable improvements in environmental condition;
- Measurable – quantifiable via an approved method;
- Permanent – the improvement is not easily reversable, and allocated credits are calculated with built in risk of reversal buffer;
- Additional – would not have happened without the project activity investment;
- Independently verified – by an approved verifier;
- Transparent – processes are disclosed to ensure confidence in the project among all stakeholders; and
- Conservative – assumptions, values and procedures ensure that environmental improvements are not over-estimated.

A key point to focus on here is 'additional'. The payment must generate more benefit to climate or nature than what **is** already happening or **would** have already happened. This means that credits are defined by what changes a land manager makes to practices in relation to a given date. Because this requires a change to existing practices, the cost of implementing changes needs to be considered along with opportunity costs. There are also costs for baselining, monitoring, verification and reporting, which are often covered in broker contracts at a rate of 30-50% of credits (CFF, 2022).

4.1 What practices?

Now to the specific practices that can generate payments! Each framework has different definitions and is applicable to different agricultural industries and sometimes different locations. The next section on predicting and measuring describes some of the tools available that may apply to an individual farming enterprise and provides a summary of the currently defined range of practices for methods discussed in previous sections[2]. Note that for each of these methods there are more extensive eligibility criteria that are not covered in this report.

4.1.1 Plant seeds or seedlings on unforested land to establish permanent forest

Four ERF methods are available to define ACCUs for new forest. These are the Reforestation/Afforestation Method; Farm Forestry Method; Reforestation by Environmental or Mallee Plantings Method; and Plantation Forestry Method (ERF, 2022). Table 4 shows a comparison of practices across these methods. Eligibility for these methods relies on what the use of the land has been over the past 5 to 7 years (ERF, 2022). As for all sequestration projects under the ERF, there is a risk of reversal buffer built into these methods. This means that a percentage of the predicted credits are not traded but used to ensure that carbon abatement is not overestimated (ERF, 2018).

[2] Blue and Teal carbon methods are not covered here as they are still under research (Deakin University, 2023) and face challenging questions about land tenure (Greber, 2022) (Fitch, et al., 2022).

Table 5: Comparison of practices between planting methods

Practice	Method			
	Tree canopy (ERF, 2022)	Environmental plantings (ERF, 2022)	New farm forestry (ERF, 2022)	Plantation forestry (ERF, 2023)
Plant native trees at a density that is expected to achieve permanent 20% crown forest cover	Yes	Yes	Yes	No
Maintain native forest cover through weed control and fire management	Yes	Yes	Yes	No
Plant a mix of local trees, shrubs and understory species OR Mallees	No	Yes	No	No
Define a harvesting regime that includes: • weed control • harvesting • debris removal • rotation length • re-establishment by planting, seeding or coppice regrowth	No	No	Yes	Yes
Measure and report projected carbon stocks using FullCAM	Yes	Yes	Yes	Yes
Establish new non-native plantation (25% discount for new short rotation plantations with 25 yr permanence)	No	No	No	Yes
Convert existing plantation from short to long rotation	No	No	No	Yes
Continue a plantation that is at risk of converted to non-forested land	No	No	No	Yes
Transition to permanent (not-for-harvest) non-native forest (45% discount for 25 yr permanence)	No	No	No	Yes

Note that:

- a land manager must decide whether to plant for permanent forest or farm forestry – they cannot switch between these methods later;

- environmental plantings for landscaping or amenity purposes are not eligible but shelter and shade belts are allowed; and
- all methods require the selection of a permanence period of either (ERF, 2018):
  - 25 years where a 25% risk of reversal buffer is deducted from calculated credits, or
  - 100 years where a 5% risk of reversal buffer is deducted from calculated credits.

4.1.2 Store carbon in soil

There are two ACCU methods under the Emissions Reduction Fund (ERF) that recognize carbon stored in soil. The first is model-based and the second is measure-based. ACCUs are calculated with reference to production and practices over the previous 5 years (CER, no date) (ERF, 2021).

Under the model-based soil carbon method one or more of three project management activities must be applied to create eligible soil sequestration ACCUs for the ERF (CER, no date) (ERF, 2022) (CSIRO, no date):

- Sustainable intensification including managing nutrients, managing acidity (pH), introducing new irrigation or renovating pasture;
- Stubble retention by shifting from baling or burning to keeping crop residues in the field; and/or
- Conversion of cropped land to permanent pasture.

This method has lower setup costs due to the use of a modeled soil carbon project baseline.

Under the measure-based soil carbon method, one or more of a broad range of management actions must be implemented as a new or materially different practice with options including (ERF, 2021):

- applying nutrients to the land in the form of a synthetic or non-synthetic fertiliser (from eligible sources) to address a material deficiency - for example, applying compost or manure;
- applying lime to remediate acid soils;
- applying gypsum to remediate sodic or magnesic soils;
- undertaking new irrigation - this involves applying new or additional irrigation obtained through improving the efficiency of on-farm infrastructure and/or management practices within your project area;
- re-establishing or rejuvenating a pasture by seeding or pasture cropping;
- re-establishing, and permanently maintaining, a pasture where there was previously no or limited pasture, such as on cropland or bare fallow;
- altering the stocking rate, duration or intensity of grazing to promote soil vegetation cover and/or improve soil health;
- retaining stubble after a crop is harvested;
- converting from intensive tillage practices to reduced or no tillage practices;
- modifying landscape or landform features to remediate land. For example, practices implemented for erosion control, surface water management, drainage/flood control, or alleviating soil compaction. Practices may include controlled traffic farming, deep ripping, water ponding or other means;
- using mechanical means to add or redistribute soil through the soil profile. For example, clay delving or clay spreading;

- using legume species in cropping or pasture systems; and/or
- using cover crops to promote soil vegetation cover and/or improve soil health.

This method is criticised for the high cost of establishing baseline data and the risk that re-assessment will not find an increase in carbon which will result in no payment (Fitch, et al., 2022).

4.1.3 Savanna Burning

Savanna Burning is one of the longest running carbon crediting methods in Australia, although the latest methods were reviewed and updated in 2018. There are two active savanna burning methods under the ERF and both require the following practices (DCCEEW, 2018):

- Conduct annual planned burning through small, controlled, early dry season fires (intended to replicate cultural burning practices) in eligible rainfall and vegetation fuel type zones; and
- Removal of gamba grass from project area (no credits issued for areas containing this weed).

The eligible rainfall zones are termed the high rainfall zone (>1000 mm/year) and the low rainfall zone (600-1000 mm/year) (Maraseni, et al., 2016). Eligible vegetation includes a range of specified open forest, woodland, open woodland and shrubland with grassy understory (DCCEEW, 2018).

4.1.4 Other ERF related practices for specific Agricultural Businesses

The methods and practices already described are those that have had the most available detail and are most widely applicable. There are further methods and practices that are specific to piggery/dairy operations (ERF, 2022), cattle production (ERF, 2022), irrigated cotton (ERF, 2022) and agriculture embedded freight (ERF, 2022).

Table 6: Further ERF methods relevant to specific Agricultural sectors

Practice	Method	Industry/s
Flaring captured methane (from digestor tank or covered pond)	Animal effluent management	Piggery/Dairy
Generating electricity from captured methane (from digestor tank or covered pond)	Animal effluent management	Piggery/Dairy
Treating volatile solids with aerobic process	Animal effluent management	Piggery/Dairy
Substitute urea supplements with nitrate lick blocks	Feeding nitrates to beef cattle	Beef cattle
Improve cattle productivity	Beef cattle herd management	Beef cattle
Reduce the average age of the herd	Beef cattle herd management	Beef cattle

Practice	Method	Industry/s
Reduce the proportion of unproductive animals in a herd	Beef cattle herd management	Beef cattle
Change the number of animals in each livestock class	Beef cattle herd management	Beef cattle
Change the rate, timing, method and type of nitrogen fertiliser application to achieve the same or better yield with less fertilizer OR better yield without increased fertiliser	Reducing greenhouse gas emissions from fertiliser in irrigated cotton	Irrigated cotton
Improve vehicle fuel efficiency by replacing or modifying vehicles or changing operational practices	Land and sea transport	Ag – business with integrated freight operations
Lower vehicle emissions by change energy source of vehicles	Land and sea transport	Ag – business with integrated freight operations

4.1.5 Reef Credits Practices

While there are two reef credit options, there are five methods (three approved and two pending the results of consultation). All Reef Credits methods apply only to land within specified Great Barrier Reef catchments. Table 6 outlines the practices within each of the methods listed below:

- Managed Fertiliser Application – currently applies to sugar cane, bananas, grains and fodder though may be expanded to other production systems (Schultz & Sinclair, 2020). All published Reef Credit projects have used this method and the activities in Table 6 reflect activities described in those projects (EcoMarkets Australia, no date);
- Gully Rehabilitation (Brooks, et al., 2020) (Wilkinson, et al., 2022);
- Wasterwater Treatment (Mulder & Neveux, 2023);
- Wetland Treatment Systems (Shoo, et al., 2022); and
- Grazing Land Management – applicable to grazing land (Yates & Silverwood, 2023).

Table 7: Eligible practices under Reef Credits methods

Method	Practices (may include but not limited to)
Managed Fertiliser Application - Approved	
	Efficient nitrogen fertiliser application
	Maintenance of green cane trash blanket, including as fallow cover after final ratoon
	All machines and implements including bed forming, tillage, planting, spraying, harvesters and haul outs will operate on the same wheel spacings and/or under GPS guidance
	At least 60% of the block un-trafficked by machinery

Method	Practices (may include but not limited to)
	Maintain row widths at 1.8-2.0m or 1.6-1.8m
	Intention to plant all sugarcane fallow land to legumes or alternate crops
	Zonal tillage only, with no more than 60% - 70% of the area cultivated for cane
	Furrow irrigation
	Irrigation application aims to replace known or modelled soil water deficit
	No irrigation tailwater will leave the farm
	Captured tailwater is rapidly reused on farm
	Up to 5 passes of cultivation equipment to prepare land for planting
	Mill mud/ash will not be applied
Gully Rehabilitation - Approved	
	Improving grazing management in gully catchments
	Fence to control livestock access to gully sites
	Porous check dams (Leaky weirs)
	Gully runoff diversion banks and drainage management
	Gully head rock chutes
	Gully reshaping and revegetation
	Gully reshaping and rock capping
	Stream bank fencing and weed control
	Stream bank revegetation (planting)
	Engineered stream bank protection and revegetation or bed protection and revegetation
Wasterwater Treatment - Approved	
	Algal Bioremediation
Wetland Treatment Systems - Pending	
	Establish a treatment wetland that removes nitrogen by filtration, sedimentation, uptake by plants and microorganisms, absorption, nitrification, denitrification, or volatilization
Grazing Land Management - Pending	
	Matching stocking to forage budgets
	Rotational grazing and wet season spelling
	Infrastructure investment in fencing and water
	Fire management
	Land condition remediation with pasture and native vegetation management, weed control, feral animal control
	Increase ground cover and land condition

4.1.6 LRF co-benefits practices

Land Restoration Fund co-benefits practices must be third-party certified by, for example, Accounting for Nature. The following co-benefits are recognized and considered when defining project payments (Queensland Government, 2023):

- Great Barrier Reef – planting of pre-clearing defined wetland or within sediment reduction targeted catchment
- Wetlands – planting of pre-clearing defined wetland
- Threatened ecosystems - planting of pre-clearing defined threatened ecosystem
- Threatened wildlife – verified condition improvement for native vegetation that is a matter of state environmental significance (MSES) for wildlife habitat OR matter of national environmental significance (MNES) for threatened species
- Native vegetation – verified improvement in native vegetation condition
- Coastal ecosystems - planting of pre-clearing defined coastal ecosystem
- First Nations by participation – project is owned by or directly involves First Nations service providers for fire management or rangers for example
- First Nations by location – on Indigenous land and provides benefits to the relevant First Nations peoples for that land
- Employment and skills – employment of regional workers and skill delivery to regional workers
- Local community benefits – in a local government area identified within quintiles 1 and 2 in the ABS Index of Relative Socio-Economic Disadvantage and generating economic and social benefits for the local community
- Soil Health – improvement in soil condition through increasing soil carbon

4.2 Predicting and measuring the value of making the change

When it comes to connecting practices with payments, there are three phases of measurement costs: first baselining, then predicting benefits and then confirming actual outcomes. Each phase has cost in either time or consultants, depending on how complex the method is and the individual skills and experience of the land manager. Initial prediction of carbon credit potential is a key piece of information for land managers before making any decision to invest further. There is one free and one paid online tool described in this section that aim to support the initial decision about the viability of carbon trading.

CSIRO has a free online tool - a landscape options and opportunities for carbon abatement calculator (LOOC-C) - that can be used to look at the carbon credit potential of any area of land in Australia (CSIRO, no date). This tool will filter out methods to only show methods relevant to the location and prior land-use of the area selected. The report provided will show an estimate of the credits that could be generated over 25 years and also provides an annual per hectare estimate. Combining this with the current ACCU auction price can give an indication of the dollar value of a potential contract and the dollars/hectare as a comparison to returns from existing production systems. Note that the risk of reversal buffer (described in Section 4.1.1) will apply and reduce the volume of defined credits that can be traded.

The Carbon Farming Foundation has paid software ($450 + 5c per hectare (excl. GST)) for calculating carbon potential called Carbon Scout (CFF, no date). This software has additional benefits, including estimated costs and yield mapping across a property to help define the most lucrative carbon project areas. The report provided includes a range of scenarios with dollars of gross profit per hectare, cost per carbon credit and useful forecast details.

Similar tools for estimating nature and social co-benefits are not yet available. Anticipating the potential of a property to generate these will require professional consultants. As described in the first section of this report, projects with co-benefits are generating much higher payments. Even so, working out what the opportunity looks like for an individual farm will have a cost with unknown returns.

There are clearly income diversification opportunities among the credit generating frameworks. The LOOC-C tool offers a vast range of estimated credits based on property location, history of land management and industry (CSIRO, no date). Running a single hypothetical area assessment on the Darling Downs there were estimates of between 0.2 – 9.4 credits per hectare. With Australian Carbon Credit Units at $17.12 (ERF, 2023) this equates to between $3.42 and $160.93 per hectare per year value. The LRF also has a very large range between a high of $9,659.26 and a low of $47.93 per hectare per year (Queensland Government, 2023). Reef Credits have equal variability with price estimates ranging from $175 - $350 per credit (Venz, 2023, p. pers coms) combined with credits per hectare between 2.1 and 19.69 (EcoMarkets Australia, no date). This means that dollars per hectare per year for Reef Credits could be anywhere from $367.50 up to $6,891.50. These figures are summarised in Table 7.

Table 8: Summary of range of $/ha/year across different credit frameworks (payment term usually 10 years)

Framework and Source	Lowest $/ha/year estimate	Highest $/ha/year estimate
ACCUs (CSIRO, no date) (ERF, 2023)	3.42	160.93
LRF (Queensland Government, 2023)	47.93	9,659.26
Reef Credits (EcoMarkets Australia, no date) (Venz, 2023, p. pers coms)	367.50	6,891.50

5 Conclusions

This review outlines a range of current options and cautions regarding environmental credits, practices and payments for Queensland agricultural producers and land managers. In summary, there are new markets emerging for ecosystem services and there are clearly income diversification opportunities among the credit generating frameworks. At the same time, the usual markets for agricultural products are expressing changed expectations about sustainable practices. Industry and land managers will also need to carefully navigate the paradox that, while disclosing poor climate or

environmental past performance may attract credits issued for changed practices, there are also examples of products being rejected by major buyers for that same disclosure of poor performance.

The pace of change in frameworks is worth noting. Some methods are being removed due to concerns about their validity (e.g., the ERF Human Induced Regeneration (HIR) method), despite their popularity; others are being removed due to lack of uptake (e.g., the ERF Dairy method) (DCCEEW, 2023). Other methods and frameworks are in development, including two that relate to land management as a whole (i.e., Reef Credits Grazing Land Management (Yates & Silverwood, 2023) and ERF Integrated Farm and Land Management (DCCEEW, 2023)) and another for biodiversity on farm (Nature Repair Market (DCCEEW, 2023)). Queensland's Land Restoration Fund and Reef Credits programs may point the way to what might be required for the Australian government's Nature Repair Market but the details are yet to be defined.

Defining credits is just the beginning and selling credits is only one option to consider. When key buyers of agricultural commodities are facing mandatory reporting of their value chain emissions and nature impacts, those credits may become a necessary farm asset to retain market access. Reporting on this may have been significantly simplified by the new Australian Agricultural Sustainability Framework (AASF) (AFI, no date) (McRobert, et al., 2022). Similar alignment and simplification of reporting to international markets has been achieved with the Taskforces on Climate and Nature related Financial Disclosures ((Kim, et al., 2023) (DCCEEW, 2023) (TNFD, 2023)). Going forward it will be critical that farm advisors, accountants, auditors, lenders, and insurers come to terms with these changes to the regulatory environment and how they will apply to producers' operations.

Finally, QLD producers need to be prepared for continued fast change as the 2030 international target deadlines for emissions reduction and nature protection approach. There will only be increasing pressure to participate in new ecosystem services markets and respond to shifts in expectations of buyers of agricultural products.

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7 Appendix A: Emitters falling under the Australian Safeguard mechanism – 2021-22

Source: (Clean Energy Regulator, 2023)

Adani Mining Pty Ltd

ADBRI LIMITED

Alcoa of Australia Limited

Alcoa Portland Aluminium Proprietary Limited

ALINTA ENERGY TRANSMISSION (ROY HILL) PTY LTD

Alliance Aviation Services Limited

Ampol Limited

ANGLO COAL (CAPCOAL MANAGEMENT) PTY LIMITED

ANGLO COAL (DAWSON MANAGEMENT) PTY LTD

ANGLO COAL (MORANBAH NORTH MANAGEMENT) PTY LIMITED

AngloGold Ashanti Australia Limited

APA (SWQP) PTY LIMITED

ASHTON COAL OPERATIONS PTY LIMITED

ATCO Gas Australia GP Pty Ltd

AURIZON OPERATIONS LIMITED

AusNet Services Holdings Pty Ltd

Australian Gas Networks Limited

BARALABA COAL COMPANY PTY LTD

BATCHFIRE RESOURCES PTY LTD

BEACH ENERGY (OPERATIONS) LIMITED

Bengalla Mining Company Pty Limited

BHP IRON ORE PTY LTD

BHP NICKEL WEST PTY LTD

BHP OLYMPIC DAM CORPORATION PTY LTD

BLUESCOPE STEEL (AIS) PTY. LTD.

BlueScope Steel Limited

BM Alliance Coal Operations Pty Limited

BOGGABRI COAL PTY LIMITED

Boral Limited

BULGA COAL MANAGEMENT PTY LIMITED

BYERWEN COAL PTY LTD

CEMENT AUSTRALIA (GOLIATH) PTY LIMITED

CEMENT AUSTRALIA (QUEENSLAND) PTY LIMITED

CENTENNIAL MANDALONG PTY LIMITED

CENTENNIAL MYUNA PTY LIMITED

CENTURION TRANSPORT CO. PTY LTD

CHEVRON AUSTRALIA PTY LTD

CHICHESTER METALS PTY LTD

CITIC Pacific Mining Management Pty Ltd

Cleanaway Waste Management Limited

Clermont Coal Operations Pty Limited

CONOCOPHILLIPS AUSTRALIA OPERATIONS PTY LTD

CORONADO AUSTRALIA HOLDINGS PTY LTD

CSBP Limited

CSL Australia

DBNGP (WA) Transmission Pty Limited

Dendrobium Coal Pty Ltd

Drake Mine Management Pty Ltd

EDL NGD (NT) Pty Ltd

ENDEAVOUR COAL PTY LIMITED

ENSHAM RESOURCES PTY. LIMITED

ESSO AUSTRALIA RESOURCES PTY LTD

EVOLUTION MINING (COWAL) PTY LIMITED

FITZROY (CQ) PTY LTD

FMG SOLOMON PTY LTD

FOXLEIGH MANAGEMENT PTY LTD

FQM Australia Nickel Pty Ltd

Goldfields Gas Transmission Pty Ltd

GRANGE RESOURCES (TASMANIA) PTY LTD

Groote Eylandt Mining Company Proprietary Limited

Gruyere Mining Company Pty Ltd

GSM MINING COMPANY PTY LTD

HAIL CREEK COAL PTY LTD

Hamersley HMS Pty Ltd

Hamersley Iron - Yandi Pty Limited

Hamersley Iron Pty. Limited

Hunter Valley Energy Coal Pty Ltd

HV Coking Coal Pty Limited

HV OPERATIONS PTY LTD

Iluka Resources Limited

Incitec Pivot Limited

INPEX Operations Australia Pty Ltd

JADESTONE ENERGY (EAGLE) PTY LTD

JELLINBAH MINING PTY LTD

Jemena Eastern Gas Pipeline (1) Pty Ltd

Jemena Gas Networks (NSW) Ltd

JEMENA NORTHERN GAS PIPELINE PTY LTD

KALGOORLIE CONSOLIDATED GOLD MINES PTY LTD

Kestrel Coal Group Pty Ltd

Kimberly-Clark Australia Pty. Limited

Liberty Bell Bay Pty Ltd

LIDDELL COAL OPERATIONS PTY. LIMITED

MACH Energy Australia Pty Ltd

MANGOOLA COAL OPERATIONS PTY LIMITED

MAULES CREEK COAL PTY LTD

Melbourne Water Corporation

METROPOLITAN COLLIERIES PTY. LTD.

Middlemount Coal Pty Ltd

MOBIL REFINING AUSTRALIA PTY. LTD.

MOOLARBEN COAL OPERATIONS PTY LTD

MOUNT ISA MINES LIMITED

MT OWEN PTY LIMITED

MULTINET GAS (DB NO. 2) PTY LTD

MURRIN MURRIN OPERATIONS PTY LTD

Narrabri Coal Operations Pty Ltd

NC COAL COMPANY PTY LIMITED

Newcrest Mining Limited

Newmont Boddington Pty Ltd

Newmont Tanami Pty Ltd

Norske Skog Paper Mills (Australia) Limited

NORTHERN STAR (CAROSUE DAM) PTY LTD

NORTHERN STAR (THUNDERBOX) PTY LTD

NORTHERN STAR RESOURCES LIMITED

Nyrstar Port Pirie Pty Ltd

OAKY CREEK HOLDINGS PTY LIMITED

OCEANIA GLASS PTY LTD

ONESTEEL MANUFACTURING PTY LIMITED

ORICA AUSTRALIA PTY LTD

ORIGIN ENERGY UPSTREAM OPERATOR PTY LTD

Orora Limited

PACIFIC NATIONAL PTY LTD

PAPER AUSTRALIA PTY LTD

PEABODY (BOWEN) PTY LTD

PEABODY ENERGY AUSTRALIA PCI (C&M MANAGEMENT) PTY LTD

PILBARA IRON PTY LTD

Qantas Airways Limited

QCLNG Operating Company Pty Ltd

QENOS PTY LTD

QGC PTY LIMITED

QMAG PTY LIMITED

QUEENSLAND ALUMINA LIMITED

Queensland Nitrates Pty Ltd

RAVENSWORTH OPERATIONS PTY LIMITED

Regis Resources Limited

Resource Pacific Pty Limited

RIO TINTO ALUMINIUM (BELL BAY) LIMITED

RIO TINTO ALUMINIUM LIMITED

Rio Tinto Shipping (Asia) Pte Limited

Robe River Mining Co. Pty. Ltd.

ROLLESTON COAL HOLDINGS PTY LIMITED

Roy Hill Holdings Pty Ltd

RTA GOVE PTY LIMITED

RTA WEIPA PTY LTD

RTA Yarwun Pty Ltd

Santos Limited

SHELL AUSTRALIA PTY LTD

Shoalhaven Starches Pty Ltd

SIMCOA OPERATIONS PTY. LTD.

SOJITZ DEVELOPMENT PTY LTD

South32 Cannington Proprietary Limited

South32 Worsley Alumina Pty Ltd

STANMORE RESOURCES LIMITED

STANMORE SMC PTY LTD

TAHMOOR COAL PTY LTD

TEC DESERT PTY LTD

THE AUSTRALIAN STEEL COMPANY (OPERATIONS) PTY LTD

THE PILBARA INFRASTRUCTURE PTY LTD

THIESS PTY LTD

Toll Holdings Limited

TOMAGO ALUMINIUM COMPANY PTY LTD

Tronox Management Pty Ltd

TT-Line Company Pty. Ltd.

UNITED COLLIERIES PTY LTD

V/Line Corporation

Veolia Environmental Services (Australia) Pty Ltd

VEOLIA RECYCLING & RECOVERY ANZ PTY LIMITED

VIRGIN AUSTRALIA HOLDINGS LIMITED

Viva Energy Refining Pty Ltd

WAMBO COAL PTY LIMITED

Warkworth Mining Ltd

WILPINJONG COAL PTY LTD

WOLLONGONG RESOURCES PTY. LTD.

Woodside Burrup Pty. Ltd.

WOODSIDE ENERGY GLOBAL PTY LTD

Woodside Energy Ltd.

Yara Pilbara Fertilisers Pty Ltd

YARRABEE COAL COMPANY PTY. LTD.

Yilgarn Iron Pty Ltd

8 Appendix B: Sustainability Frameworks reviewed in the preparation of the AASF

Table: International and National frameworks considered in the development of the Australian Agricultural Framework

Global Sustainability	Global Agriculture	Domestic Agriculture
Taskforce on Climate-Related Financial Disclosures (TCFD)	Roundtable on Sustainable Palm Oil	Smartcane Best Management Practice (Australia)
Taskforce on Nature-Related Financial Disclosures (TNFD)	Global Roundtable for Sustainable Beef	Aboriginal Carbon Foundation (carbon credits)
Climate Disclosure Standards Board	Roundtable on Responsible Soy	Australian Eggs Sustainability Framework
Global Reporting Initiative (GRI) – agricultural standards	Forest Stewardship Council	Beef Sustainability Framework
Integrating Reporting Framework (IR)	Programme for the Endorsement of Forest Certification	Behind Australian Grains
Sustainability Accounting Standards Board (SASB) Index	Sustainable Forestry initiative	Dairy Sustainability Framework
Carbon Disclosure Project (CDP)	Marine Stewardship Council	Australian Government Emissions Reduction Fund
IFRS	Aquaculture Stewardship Council	Hort360 (Growcom)
Impact Management Project (IMP)	Bonsucro	Horticulture Sustainability Framework (under development)
WEF IBC common metrics	Vive Programme	Making More from Sheep
ISO2600 Social Responsibility & ISO13065 Sustainability criteria for bioenergy	Sustainable Agriculture Institute (SAI) Farm Sustainability Assessment program (FSA)	MLA CN30 Project
CSL Biodiversity Action Plan	Sustainable Apparel Coalition (SAC) Higg Index	MyBMP (cotton)
Climate Disclosure Standards Board (CDSB)	Better Cotton Initiative	National Feedlot Accreditation Scheme (NFAS)
System of Environmental Economic Accounting (SEEA)	UTZ and Rainforest Alliance (merged in Jan 2018)	Reef Credit Scheme (by Green Collar)
International Organisation of Standardisation (ISO)	Common Code for the Coffee Community	Sustainable Grain Australia (Canola into EU)
UN Sustainable Development Goals (SDGs)	Fairtrade	Sustainable Winegrowing Australia
ISEAL Alliance	Joint Accreditation Scheme Australia & NZ (JASANZ)	Territory Conservation Agreements (TCA)
FAO Sustainability Assessment of Food and Agriculture Systems (SAFA)	International Sustainability & Carbon Certification (ISCC)	NSW Biodiversity Offset Scheme
	Sustainable Agriculture Network (SAN) Sustainable Agriculture Framework	QLD Land Restoration Fund
	Global Good Agricultural Practices (GAP)	Midlands Conservation Fund (Tasmania)
	ISO 13065 Sustainability criteria for bioenergy	Australian Sustainable Products (ASP Certified)
	Roundtable for Sustainable Biomaterials (RSB) – Biomaterial feedstock production	AgCarE (AgForce)
	Montreal Process Criteria & Indicators	

Source: (McRobert, et al., 2022)