

Keynote speech delivered Skye Glenday to the Digital Agrifood Summit 2022

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How can we make it easier for farmers to participate in the emerging carbon economy?

Good morning and thank you for the opportunity to share some insights on Australia's emerging carbon market and the intersection with agriculture, technology, and sustainable, or indeed circular, food production.

Firstly, I would like to acknowledge the Traditional Custodians of the land on which we are meeting, the Wiradjuri people, and pay respect to Elders past, present and emerging, and extend my respect to all First Nations Peoples here with us today.

As researchers, policy makers and businesses engaged in the agricultural sector, I don't need to convince you about Australia's huge opportunity to continue to be a leader of cost-competitive, sustainable agriculture globally, achieved through a combination of innovative technologies and data-driven land management practices. This is the Food Agility CRC's mission, and we have heard about many aspects of this opportunity over the course of this conference.

What I would like to share, is some thoughts on how carbon farming could be better integrated into agricultural practices.

I believe that better integration can deliver a threefold opportunity:

- increasing agricultural productivity and production of sufficient, nutritious food for our growing global population;
- drawing down carbon from the atmosphere to help tackle the climate challenge;
- and expanding biodiverse habitat through landscape and property level planning.

You will hear the word integration many times throughout the next 15 minutes or so, as this is the key to unlocking carbon farming, an integrated package of land management activities rather than a standalone carbon economy.

Right now, there are around 800 registered land based carbon farming projects in Australia – which means just one per cent of agricultural properties are currently participating in the carbon market. This means there is potential for a step change in adoption of carbon farming through better integration into sustainable agricultural systems.

Before I dive into the details of the carbon farming opportunity and how we can make it easier to participate, I'd like to share a bit about myself and Climate Friendly.

[As [*Madeline*] indicated], I am currently the Co-CEO of Climate Friendly and a Director of the Carbon Market Institute, which is the Australian carbon sector's independent industry association.

However, I first got a taste of the nascent carbon farming industry when I joined the newly established Australian Government Department of Climate Change in 2007. This was a dream position for me, as I had always had a passion for nature and the land. Though I grew up on Gadigal country in western Sydney, my mum's family came from Cobar & the Burratorang Valley, and my dad's from the QLD granite belt and Blackwater. I had the privilege of working in the government through the original design of the carbon farming initiative. I also got to work internationally on the global accounting frameworks for land-based carbon, and early pilots of carbon farming projects with the Indonesian Government, as both a government employee and later within the research sector. I then leapt at the chance to join Climate Friendly and build on this policy and research experience to work with agricultural producers in Australia and translate the theory into practice.

Climate Friendly was founded 19 years ago by a CSIRO scientist with the goal of providing extension services to support agricultural producers, foresters, and Traditional Custodians to achieve a productive, sustainable land sector that contributes to a net zero emission Australia by 2050.

Climate Friendly has early runs on the board – working in partnership with land managers around Australia we met our first target to deliver 20 million tonnes of carbon abatement at the end of 2020. We are now working to scale this up to achieve 100 million tonnes of carbon abatement by 2025.

Since the carbon farming initiative was first introduced nearly 10 years ago, we have helped land managers to establish over 140 new projects covering 10 million hectares of land – a third of these managed in partnership with the Traditional Custodians of the land.

Each project involves around 12 people in Climate Friendly with unique skills and expertise to support our carbon farming partners all the way from project feasibility, governance and structure, audits through to carbon credit issuance and trading. As we heard on the last panel, complex problems and projects need skilled interdisciplinary expertise and partnerships to deliver the best results.

While the work of our team, our partners on the ground, and others involved in the carbon farming sector is a good start, we collectively have a long way to go to unlock participation for the 99% of land managers who have yet to begin their own carbon farming projects.

So, how do we seize this opportunity and make it easier for agricultural producers to participate in the carbon economy?

There is currently a wide and growing menu of options for land managers to get involved in the carbon or environmental services markets. This includes:

1. 16 agricultural or vegetation management emissions reduction fund carbon methods
2. Climate Active or other emerging carbon neutrality standards
3. A variety of government biodiversity programs, such as the Australian Government C+B pilot, Biodiversity Conservation Trust in NSW or Land Restoration Fund in QLD, or other standards (such as Accounting for Nature)
4. A growing range of sectoral targets, such as MLA's carbon neutral by 2030 for the red meat industry...
5. Numerous grant funding opportunities for plantings or soil tests

6. The list goes on...

The growing set of opportunities signals an increasing move to more sustainable land management practices. However, the menu of options is also incredibly complicated for individual producers and even large agribusiness to navigate, and it is not a one size fits all approach.

In addition, each opportunity comes with its own set of technical rules and eligibility criteria, and consequent transaction costs associated with implementation, compliance and audit.

Programs are often regulated by different government agencies or different levels of government, or sometimes private standards. This means even finding the right paperwork and managing the administrative load is a heavy burden requiring a multitude of skills, let alone the actual activity design and implementation in the paddock.

Further, each opportunity, project or program, tends to relate to a single activity. For each activity – like planting a native species as a shelter belt or shifting to rotational grazing to improve soil carbon – you need a separately registered project and end up duplicating a lot of the management and compliance requirements.

While the focus on a single activity makes sense from a scientific accounting perspective, this is typically not well aligned with the reality that agriculture, soil, water, vegetation and other natural capital exist in a set of connected systems, which are managed holistically by the farmer or land manager.

For example, rotational grazing done well can not only improve soil health, but can also result in improved liveweight gain and promote regeneration of vegetation to deliver important habitat for biodiverse species and shade for livestock. A single activity, single project approach also commonly means projects do not meet commercial viability thresholds, limiting uptake.

Agricultural producers typically manage their farm holistically, commonly with a mixed farming enterprise producing a range of agricultural products. So why should carbon methods be one dimensional?

The good news is that a new generation of carbon farming method is on its way – the integrated carbon farming method is under development and will enable multiple carbon storage activities under a single project.

Climate Friendly has been working since early 2019 with researchers and government, carbon, agriculture, technology, resources, and conservation organisations, as well as directly with farmers and Traditional Owner groups, to develop and pilot this new integrated farming method. The method is in a co-design process with government, industry and research, due to be finalised and available for use by early 2023.

Enabling land managers to implement multiple carbon storage activities under a single project will dramatically improve the financial viability of carbon farming. Further, it will make it easier to adapt and adopt a property specific approach across the full diversity of Australian landscapes, agricultural practices, and ecosystems.

This is not a one size fits all program – we know that does not work for agricultural production.

Each producer will have the flexibility to select the right package of activities that align with their biophysical potential, property management goals and landscape connectivity, along with their business legal structure or family circumstances.

This integrated carbon farming method has the potential to make high quality carbon farming projects available to thousands of land managers and could enable up to 2.5bn tonnes of carbon abatement in Australia over the next ten years.

In order to build in a degree of future proofing, the integrated farm method is being designed in a modular manner. New technologies or management practices can be “plugged in” when ready.

In future updates this could include not only land-based carbon storage activities, but also farm electrification and renewable energy production. This could be further expanded to also include the integration of natural capital accounting.

This more streamlined approach is probably the single most important thing we can do in the immediate term to make it easier for farmers to participate in the carbon economy – making carbon farming viable for a whole new cohort of land managers.

It is needed so that companies like AACo – who are already looking at the breadth of carbon and natural capital opportunities that apply to their land – can take the steps within a credible, accountable and value-adding framework to improve their productivity, reduce greenhouse gases and generate environmental benefits. We will hear more from Naomi Wilson on this during the panel discussion.

While it will not remove all the complexity and diversity of carbon farming in one hit, the integrated farm method represents a major advance in the management of carbon farming projects in Australia.

[As the integrated farm method comes online, how can we ensure that implementation is optimised and verify that it has high integrity for the long term?](#)

The method must be supported by a national integrated data sharing platform. We heard a bit about this topic yesterday afternoon.

You may have seen questions raised about the integrity of some carbon farming methods over recent months. When these claims are examined more closely the heart of the issue is in fact about data availability, quality and consistency across property, regional and national scales.

Firstly, you might ask why “integrated data”? Well, carbon farming activities like agricultural and ecological systems more broadly involve multi-dimensional factors.

For example, weather and climate, management practice, biophysical potential of the land driven by soil type and water availability, and many other factors. Examining soil samples or a vegetation map without knowledge of these other factors is of limited utility.

In order to optimise carbon storage, agricultural productivity and natural capital over time, we must have integrated data sets.

Right now, relevant data is often siloed based on data type. We have made some progress towards integration, for example, the Terrestrial Ecosystems Research Network, or TERN, was first launched in 2009 as a research collaboration and contains a growing library of ecological data.

Separately, the Australian Government recently announced a national soil database which contains carbon content and other soil test results.

The NLIS or National Livestock Identification System contains important livestock tracing information relating to cattle, sheep and goats, albeit with some important productivity information not yet fully incorporated in that system.

Other data driven initiatives are emerging, which all make valuable contributions within their defined scope or scientific field.

Not only is data often siloed by type, but also by organisation. There is a wealth of agricultural and environmental data held by disparate public and private sector entities, agricultural organisations, research bodies and even individual land managers.

Currently Climate Friendly is a part of this segmented data landscape. The over 140 carbon farming projects we support are data rich. While Climate Friendly and our project partners contribute to a number of research partnerships, it is complex to share the volume of data that we collect in the absence of a national database. For example, project data includes:

- Over one billion pixels of UAV and Lidar data per year, processed into 3D models of vegetation height, canopy cover and density.
- Sentinel satellite data calibrated at a property scale across our 10 million ha project portfolio to track regeneration and pasture biomass.
- Soil carbon samples at depth.
- Property management data, including livestock information and infrastructure improvements, such as water points or fencing.

All of these data sets are collected as time series information – starting from ten years before the project commenced, and then as frequently as quarterly datasets through the 25-year project lifecycle.

If that is the data contribution from our carbon farming projects alone, imagine the wealth of information the universities, government agencies, technology, agricultural institutes, other carbon project service providers and individual land managers in this room could collectively contribute!

Fragmented data is a handbrake on opportunity. If more comprehensively integrated, these data sets could enable a step change in our collective understanding of management practices, agricultural productivity and sustainability impact from both a carbon and natural capital perspective.

So what else could we gain from a national integrated database covering all facets of the land sector?

Yesterday we heard about benefits for productivity gains and benchmarking for producers.

Having integrated data allows us to also understand the benefits or trade-offs between productivity, carbon and natural capital. This supports landscape planning and optimised participation in an integrated farm method.

Sharing big data drives down costs and supports increased, evidence-based land management.

For example, one of the biggest transaction costs for participating in carbon farming is the on-ground measurement cost. Increasingly that means we use systems like FlintPro, which Rob DeLight will shortly talk about, to model carbon, production and natural capital benefits in periods between measurement intervals. The more calibration data, the better the model. And with better models we can reduce the measurement sampling or intervals but maintain project integrity.

Secondly, we currently have different precision of data at national, regional and property scales. This can lead to misunderstandings and policy or operational translation issues because different scales of data lead to different conclusions.

For example, some of the recent commentary on carbon market integrity originates from this issue. National data sets are being used to assess whether carbon projects are delivering impact on specific properties.

These data sets are different to the data used by the carbon projects – for example as described earlier Climate Friendly collects extensive property specific information and calibrates datasets specifically for its project portfolio.

By comparison, some of the national spatial datasets are currently calibrated with just a few thousand ground data points and the management information is not available. The differences can be significant – for example imagine a map of your property or region which showed only the sealed roads compared with all unsealed access roads. Limited information means limited insights, and, ultimately, limited opportunity.

If data is shared using the latest technology, with all the appropriate privacy protections as we heard about yesterday, we can improve consistency in datasets and therefore deliver greater transparency and ensure our carbon, agricultural and natural capital sectors are duly credited for their high integrity.

Beyond the data management technology, I would like to turn to another big “integration” concept - emerging technology more broadly.

The agricultural sector still accounts for 15% of Australia’s national carbon emissions. An integrated farm method, coupled with integrated data will enable a step change in carbon farming projects, but there remain some currently unavoidable emissions from agricultural production. New technology, some of which is on showcase here today, provides an answer to this problem.

For example, Guy Webb will shortly talk about the work of Loam Bio, who are applying microbiology smarts to get the bugs quite literally into soil. Livestock additives are another technology frontier, whether through legumes or other solutions such as Asparagopsis or 3NOP. These have made leaps and bounds in the feedlot context, and work is underway to expand these technologies to the grazing herd context.

While these technology advances are impressive, we need to ensure that they can “plug in” to our modular integrated farm method and data management systems as they become available.

Historically, incorporation of new technology into carbon farming has been problematic. For example, soil carbon methods have been prescriptive on permitted soil measurement technologies, requiring physical sampling. Emergent technologies to soil measurement, such as lidar or similar approaches, should be able to be utilised and “plugged in” to the new integrated farm method as they are proven.

Beyond technology, there is one further important integration which we heard a lot about at dinner last night.

The integration of First Nation knowledge with emerging science, technology and agricultural practices. There is much we can learn for our First Nations partners and their 80,000 odd years of sustainable land management.

I mentioned either that one third of the projects Climate Friendly supports involve Traditional Owner partners. We have seen first-hand through the benefits of these partnerships for both our agricultural producer and Traditional Custodian partners, who have a shared passion for healthy country and thriving regional communities.

Collaborating on carbon projects is based on their shared love of the “where”, instead of the “who”, which is breaking down barriers in working together. This valuable paradigm of focusing on the “where” to move forward in a collaborative way was introduced to us by Professor Stan Grant Jr last night.

Now turning to how can the new government support this step change and make it easier for agricultural producers to participate in carbon farming.

Integration, integration, integration should be the anthem of the new government.

We are lucky that carbon farming has long had bipartisan support. However, with the Albanese Government’s commitment to a 43%

emissions reduction by 2030, we have an opportunity for a step change and to grow our collective ambition for a sustainable, thriving regional Australia.

There is an important opportunity for the 47th parliament to work in an integrated way across foundational high priority policies which have multi-party and broad community support.

The newly appointed Ministers for Climate Change & Energy, Environment & Water and Agriculture, Fisheries and Forestry and Indigenous Australians must work together to support and engage the breadth of our rural, regional and remote communities and deliver an integrated approach that works on the ground, rather than operating in siloes of their respective portfolios.

If we work together in the next phase of transition to a net zero economy, the opportunity is enormous.

On the climate change front, Australia has huge potential to draw down carbon in our vegetation and soils.

Estimates by the WRI and The Nature Conservancy indicate that regenerating landscapes globally has the potential to absorb up to 8.9 billion tonnes of carbon dioxide from the atmosphere each year through to 2050, while still maintaining native grasslands and current levels of food production.

Translating this to a more local opportunity, increasing vegetation cover by 10% in NSW alone has the potential to draw down on average 75 million tonnes of carbon for the next 20 years.

On soil, the opportunity is similarly large. The University of Sydney has estimated that globally we have potential to store 1-3 billion tonnes of carbon in soil annually – which equates to around 50 million tonnes of carbon per year in Australia.

If well integrated, regenerating our land and improving soil health can not only deliver carbon storage, but can reverse our current rapid biodiversity loss and improve agricultural productivity and support thriving regional communities – healthy people living on and actively managing healthy land.

As we work towards a net zero world by 2050, the World Resources Institute has estimated that food production globally needs to increase by as much as 60% to feed the growing population. Integrated carbon farming presents a huge opportunity to position Australia as a preferred supplier of sustainable produce globally. If we can achieve integrated data and a system that allows technology innovations to 'plug into' carbon farming projects as well, the potential for positive change in the agricultural sector is enormous.

Skye Glenday

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