

# Developing Trends in Agriculture and Environmental Markets and Data

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Thanks to my long suffering wife Angela for her support during my PhD.

**Abstract**—With Agriculture responsible for over 50% of Australia’s natural capital farmers are increasingly being required to undertake practice change to address its degradation and reduce GHG gas emissions. Driving forces are the basic causes of the decline in natural capital. Driving forces that include population growth and the industrialization of agriculture that place pressures on agricultural land use. Pressures including land use intensification, and the economic pressure to produce more food from less land, for less. This results in impacts that can manifest through conflict, food shortages and declining ecosystems.

**Index Terms**—Agriculture, Environment, Degradation, Natural Capital, Data

## I. INTRODUCTION

**W**ITH Agriculture responsible for over 50% of Australia’s natural capital and farmers are increasingly being required to undertake practice change to address its degradation and reduce GHG gas emissions. Driving forces are the basic causes of the decline in natural capital. Driving forces that include population growth and the industrialization of agriculture that place pressures on agricultural land use. Pressures including land use intensification, and the economic pressure to produce more food from less land, for less. This results in impacts that can manifest through conflict, food shortages and declining ecosystems.

To respond, a growing list of frameworks and reporting mechanisms are evolving. These frameworks enable the impact of practice change in agricultural systems to be clearly measured and outcomes validated. Changes that aim to benefit not only society but focus on improving agricultural productivity and reducing financial risk on farm and through the supply chain.

Australia has been proactive in this space developing frameworks and legislation to incentivise this change. Biodiversity Offset Legislation across all states and territories is designed to offset loss of biodiversity from development. The Carbon Farming Initiative Act 2014 and the creation of the Emissions Reduction Fund have been designed to encourage, and reward financially, practice change and projects (particularly in Agriculture) that avoid release of greenhouse gas emissions or remove or sequester carbon from the atmosphere. In addition, the current federal government has recently passed its Nature Repair legislation to incentivise the creation of markets for biodiversity credits.

Globally, in 2023 The Task Force on Nature related Financial Disclosures (TNFD) released its voluntary reporting and disclosure framework. This framework recognises nature as a

financial risk and enables organisations to report and act on evolving nature related risks and opportunities that may impact their business. Australia, New Zealand, UK and the US have developed clear strategies to account for Natural Capital using Natural Capital Accounting tools such as the UN’s System for Environmental Economic Accounts (SEEA).

Investors are increasingly focused on the impact their investments have on the environment and are moving to more robust reporting systems that utilise tools such as the TNFD and ESG to inform investment and business decisions. This trend will increasingly require more data to verify claims and avoid green washing.

At this time many of the initiatives, highlighted or proposed, are currently voluntary with no obligation to participate or implement them. What is important to recognise that despite the voluntary nature of these tools’ there is a trend for agriculture to embrace these new approaches, despite the value proposition being unclear. Farmers are slowly beginning to explore the opportunities these risk management and supply chain reporting tools may unlock.

With a growing push for these initiatives to become mainstream farmers should prepare and educate themselves around these changes. There is increasing evidence some industries are beginning to actively seek information from clients around Scope 1, 2, and in some cases 3, emissions. This is being driven by the move to mandatory climate disclosure requirements under IFRS S2 from 2024. While others in the supply chain are actively moving to implement reporting regimes around TNFD criteria. What is important is the frameworks and legislation require robust data to validate outcomes.

**This makes Data valuable** and Farmers are an obvious source of this data. Unlike an agricultural commodity, data has multiple applications and users and extracting value from this will be a key opportunity and challenge. Navigating the data maze, particularly given the multitude of reporting frameworks, regulations, technology, and legislation will be complex. The National Farmers Federation (NFF) proposes a voluntary Farm Data Code to assist farmers in understanding how services providers are collecting and using farm data and identify potential economic benefits for farmers.

Recent initiatives, such as Farming for the Future, Accounting for Nature etc. aim to assist farmers in providing the evidence and tools for incorporating natural capital as part of farming businesses. Taking this data into the next stage where the data can be used effectively, shared or traded as an asset (such as for biodiversity credits) provides further pathways for farmers to engage more broadly with its supply chain and

generate economic benefits.

There will be challenges as experience and knowledge is lacking which will require capacity building to educate farmers, the supply chain and their advisers on the frameworks, technicalities, concepts, integrity, security of data.

Legal structures will be required to protect farmers and their data, through ownership and/or rights agreements. Effective technology will be required to collecting, storing, translating data while keeping costs down. This will require collaboration to avoid the risk of fragmentation of markets with multiple systems that do not talk to each other create confusion. In 2019 the Nationals Farmers Federation raised concerns that poorly executed policies and approached “could saddle farm businesses with additional costs”. This remains a significant risk as these changes begin to manifest.

## II. CONCLUSIONS

The growing number of voluntary initiatives and frameworks focused on nature related risk management and climate change are creating new challenges for agriculture. These challenges centre around practice change and collecting data to validate outcomes from these changes. This will require agriculture and its supply to chain to build skills and knowledge around these new approaches particularly when many are not specifically designed for agriculture but designed to include agriculture. Without knowledge and skills there is likely to be growing confusion that can lead to an inability to transition these changes into action. Data that is valuable to both farmers and the supply chain will require measures and rules to ensure equitable outcomes from the potential economic gains in the use of data to avoid conflict. Currently these new initiatives are voluntary although there are growing moves for compulsory nature reporting there is little clarity around who will be responsible for the regulatory functions to ensure frameworks are fit for purpose and disclosure of results are aligned with global or national standards.



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