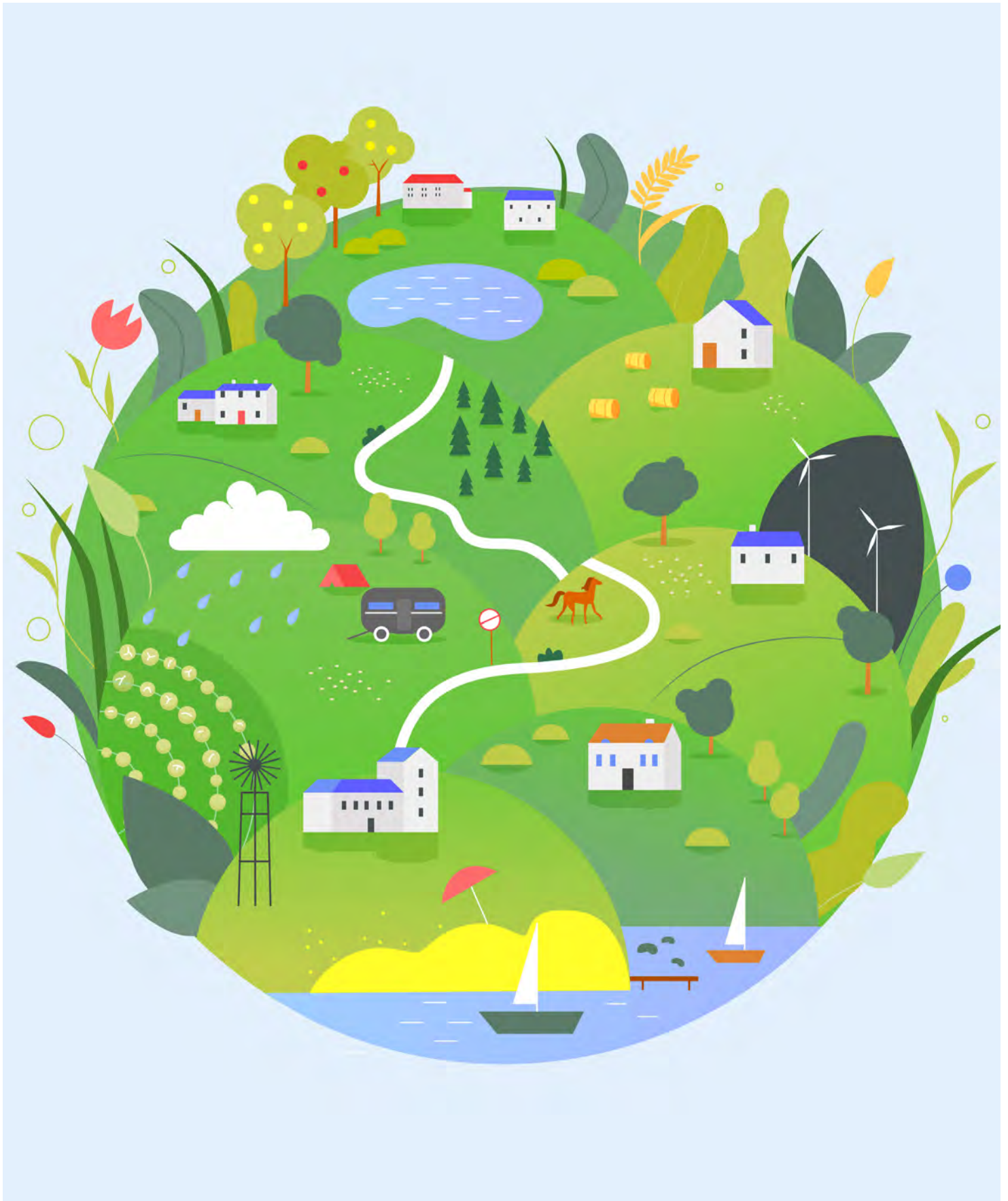


Global Farmland Index



0.2%

The average global farmland value growth, during 2020

10%

Compound annual rate of increase since 2002

Standing strong and offering solutions to pressing global issues

In a year dominated by the Covid-19 pandemic, global farmland performance has demonstrated resilience

Savills Global Farmland Index tracks average capital value performance for crop/arable land types across the world. During the past 18 years (2002-2020) the Index has recorded a 10% compound annual rate.

Covid-19 had a momentous impact on economies across the globe and the farmland market was not immune to economic pressures. During 2020, the Index recorded average global farmland value growth, albeit small at 0.2%, but a swing from the decrease in values recorded in 2019 (figure 1). A significant influence on 2020's Index was the large shift in currency values as countries struggled with their health crises. In domestic currency only five countries analysed showed a fall in average annual performance: New Zealand; Ireland; Uruguay, Argentina and Denmark. Average farmland values in Brazil increased by nearly 14% in local currency, but the Index reports a decline of almost 13% due to the Brazil Real falling substantially against the US dollar.

New Zealand witnessed a reduction in average farmland values, while Australia recorded an increase. Although the market in New Zealand was not particularly affected by currency shifts, the country's response to the pandemic, with borders closed to almost the entire world, meant international purchasers could not easily participate in the market, even within their existing restrictions on foreign investment. Values in Western

Europe and North America have remained steady in 2020, posting small increases, such as the 1.5% increase in the UK (0.9% in domestic currency).

THE INFLUENCE OF COMMODITY PRICES

Investment in farmland is also impacted by productivity and markets. The market in Argentina was impacted by dry weather in 2020, so with the country facing food price inflation and a contracting economy, the government introduced restrictions on the sale of maize in the global market (although it was partially reversed at the last minute) and increased export taxes on soya beans. Farmland values in Argentina have now fallen for a seventh year, falling 30% since 2014.

Compared to other primary assets, gold was a stand-out performer during 2020, as investors sought an asset to hedge against uncertainty (figure 2). In comparison, the global cereals and food indexes along with the Global Farmland Index reported more steady growth. However, the importance of farmland in terms of food and energy security and increasingly environmental sustainability means the demand for farmland continues.

THE RISK AND REWARDS OF PURCHASING FARMLAND

Population growth is seen as the main driver for growth in the demand for agricultural productivity. The World Bank forecasts indicate that food commodity prices will generally rise in real terms over the next decade, including wheat (1%), barley (12%), chicken (3%), while the price of beef will fall 13%. However, the ability for land to provide solutions to a range of pressing issues facing society, from reversing the biodiversity crisis to offering carbon sequestration through soil management, could support future land values through differing income streams and new classes of investor targeting the sector. As with every investment, however, there is a risk to capital. Figure 3 illustrates there is a correlation between countries that outperform others with capital growth, but have the largest swing in values over the same period.

Welcome to the 2021 edition of Savills Global Farmland Index. There is no doubt that the Covid-19 pandemic will dominate the history books of 2020. Although the longer term effects of the pandemic are unknown, the global disruption is unprecedented and the economic cost and implications on people's health and wellbeing continue to escalate.

While it didn't grab as many headlines, 2020 was also exceptional because, according to NASA, it was the hottest year on record. Many countries around the globe faced extreme weather events, from the Australian bushfires, flooding in China and heatwaves in Europe. The pressure on preventing a climate crisis is building. There is heightened interest in the contribution land can make to tackle the issues climate change is presenting, not least the ability for soil to sequester carbon from the atmosphere.

The importance of farmland in terms of global food and energy security, environmental sustainability and economic growth means the asset class continues to attract considerable interest. This report provides an update on global farmland value trends and focuses on the market for soil carbon sequestration and how it differs around the world.

Richard Binning

Director of Farms and Estates

SAVILLS GLOBAL FARMLAND INDEX

The Global Farmland Index is based on data from the average value of crop/arable land in US\$ per hectare from 15 key farmland markets – Argentina, Australia, Brazil, Canada, Denmark, France, Germany, Hungary, Ireland, New Zealand, Poland, Romania, United Kingdom, United States and Uruguay. Converting to US\$ per hectare gives potential investors a good starting point for comparable analysis. It is a common denominator that corresponds to the currency of global markets. The values are relative to those in the year 2002 (2002 = 100). Exchange rates will affect the performance in domestic currency. Additionally, using average values disguises what might be happening at local or regional level, as values can vary significantly.



“The ability for land to provide solutions to a range of pressing issues facing society could support future land values through differing income streams and new classes of investor targeting the sector”

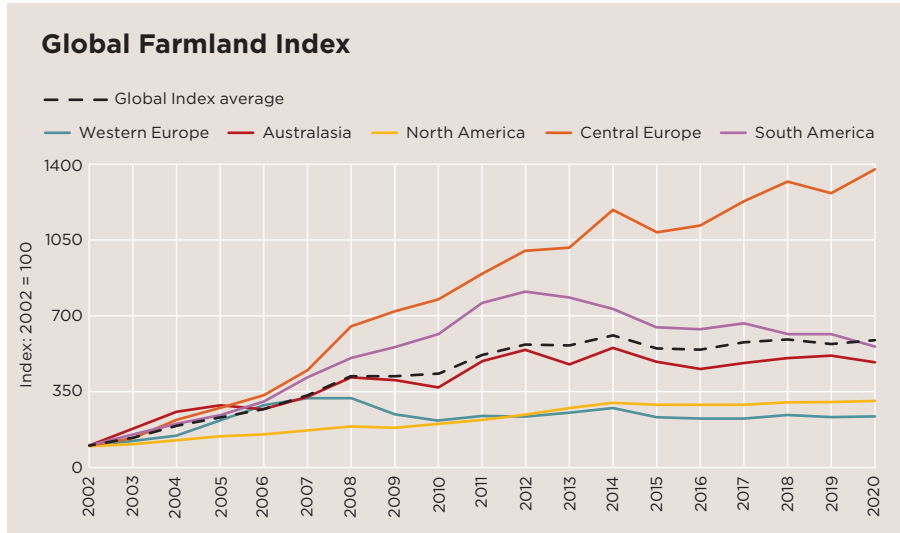


figure 1 Source Savills Research, USDA, REINZ and various other data sources/estimates

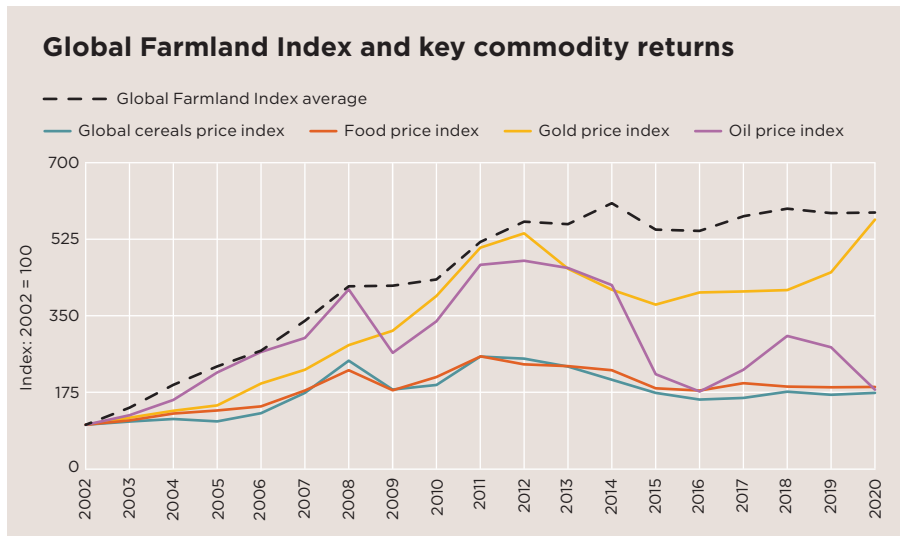


figure 2 Source Savills Research, FAO, OPEC, KitCo

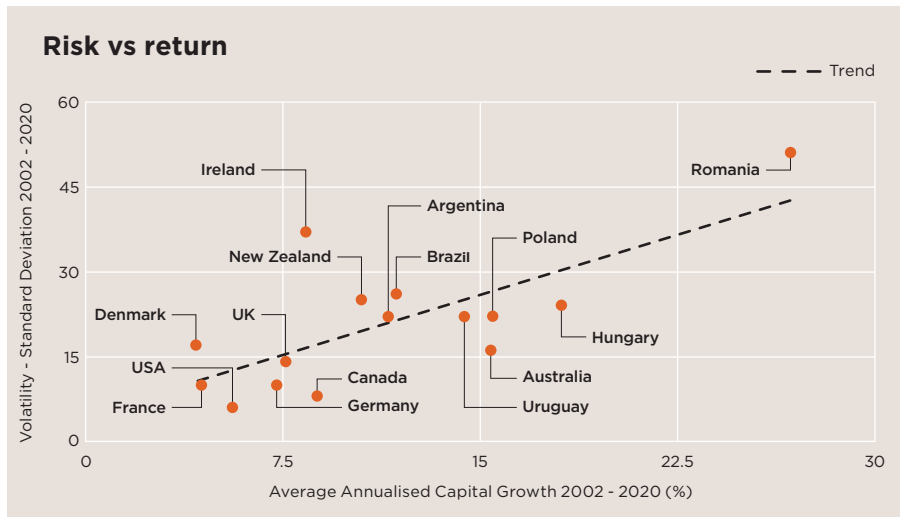


figure 3 Source Savills Research, USDA, REINZ and various other data sources/estimates

COVID-19: GLOBAL ECONOMIC IMPACTS

While the economic damage from the global Covid-19 pandemic is ongoing, early estimates predicted that major economies could lose at least 2.9% of their GDP in 2020 (Statista). This forecast was restated to 4.5% of GDP, equivalent to 3.94 trillion U.S dollars.

Global stock markets have also suffered dramatic falls due to the Covid-19 outbreak, although they were able to recover from the losses quite quickly. The Dow Jones reported its largest-ever single day loss of almost 3,000 points on March 16, 2020 – beating its previous record of 2,300 points that was set only four days earlier.

LAND MARKETS - REGULATION UPDATE

■ In March 2020, the Ukrainian government voted to end the moratorium that has prevented landowners from selling land for nearly 20 years. Ukrainian citizens can buy up to 100 hectares, although the law preventing international purchasers remains in place for now. The legislation gave the government over a year to prepare for the changes, which came into force on 1 July 2021. With Ukraine home to a quarter of the world’s “black soil”, offering huge potential for food production, the impact on this legislation on investment in the sector will be watched closely.

■ In August 2020, Romania introduced restrictions on the sale and purchase of agricultural land. The conditions appear to give preference to buyers having a domicile or residence in Romania for a period of at least five years and buyers with past experience in farming in Romania. The legislation also restricts the sale of land within eight years of purchase by charging an 80% tax on any uplift in value during the period of ownership.

\$3.94tr
estimated predicted loss to major economies caused by global Covid-19 pandemic

“Farmers across the planet are seeing carbon farming as a route to new and profitable income streams”

Climate change – an international effort

Soil carbon sequestration has a key role to play in reducing atmospheric carbon and may provide an added bonus to farmers

Multiple factors, at international and national levels, are driving the action on curbing emissions in order to tackle climate change. The landmark Paris Agreement (2015) is an international concord that aims to restrict global temperature rise this century to less than 2°C above pre-industrial levels and to pursue efforts to limit the increase to a maximum of 1.5°C. The UN's Intergovernmental Panel on Climate Change (IPCC) report in 2021 found that, under all emissions scenarios, both targets will not be met unless there is a substantial reduction in carbon emissions within the next few years.

In 2014, the IPCC estimated that agriculture, forestry and land use accounted for 24% of global greenhouse gas (GHG) emissions. However, the ability for land to sequester carbon was not included in that estimate and therefore it is estimated that net carbon emissions from agriculture, forestry and land use could actually be in the region of 4% of the global total. As global finance and supply chains begin to take account of their direct and indirect impacts on climate and

biodiversity, the role that primary production plays is firmly in the cross hairs. Meanwhile, farmers across the planet are seeing carbon farming as a route to new and profitable income streams.

SOIL CARBON MARKETS

The market for carbon investments and offsets is not new, however the increased urgency of the climate agenda has boosted the interest in, and relevance of, the marketplace. Around the world, land managers have the opportunity to store carbon in the soil through regenerative agricultural practices and sell that captured carbon in the market for offsets. Restoring soil carbon has co-benefits for farmers, including increased productivity and environmental resilience, but it is not without its critics. Cheap offsets mean that more expensive decarbonisation efforts are not prioritised, limiting the long-term structural adjustments needed to meet IPCC targets.

It is important to recognise the difference between purchasing land for commercial carbon offset creation

KEY CRITERIA OF A QUALITY CARBON OFFSET

- Real
- Additional
- Quantifiable
- Permanent
- Verifiable
- Enforceable



24%

of global greenhouse emissions are attributed to agriculture, forestry and land use

1.5°C

The Paris Agreement (2015) aims to restrict global temperature rise this century to a maximum of 1.5°C

versus investing in rural assets (such as established forestry) that already sequester carbon. These assets can represent a negative value on an owner's portfolio carbon balance, however cannot be developed into commercial carbon offsets as they fail the additionality test, as explained in more detail below.

Established carbon markets have protocols that set out the standards required to sell credible carbon offsets. The key criteria of commercial carbon offsets are the same around the world. The international nature of the carbon market means that purchasers need to consider how different offset trading platforms approach these criteria.

Farm-level payments for carbon farming can be action based or result based. Action-based schemes reward land managers for putting in place defined climate-friendly agricultural practices. In result-based schemes the payment to land managers is directly linked to measurable indicators of the climate benefits they provide. The advantage of this approach is that the use of public or private funds is more directly linked to the intended climate objective. Hybrid schemes combine elements of action- and result-based approaches, typically conferring a payment to carry out a set of management actions, which is "topped up" if farmers can demonstrate that they have delivered additional climate benefits.

It is advised that land managers who are looking to sell carbon offsets commercially must address their own business' carbon balance first. There is a risk that land managers sell offsets that they themselves may have needed, which may jeopardise their products and brand, reducing access to future supply chains. Food businesses across the globe have already made net zero carbon commitments, including Nestle, Starbucks and Mondelez. These commitments have so far often failed to take responsibility for the indirect emissions arising from their farmer and producer suppliers though.

THE BARRIERS

Soil carbon sequestration is not the only answer to solving climate change, nor is it likely to become the next commodity for all farmers to sell. Storing carbon in soil is finite; changing farming practices to capture soil carbon will work for a number of years but will, eventually, plateau at a saturation point (the IPCC use a default saturation time of 20 years). Once this point is reached, if the farming methods are significantly altered the stored carbon could be inadvertently released back into the atmosphere. The recent wildfires in America illustrates this issue with any nature-based solution – how can permanence be guaranteed, and who bears the risk and cost of failure?



■ **Measurement:** Accurately measuring year-on-year soil carbon changes is less reliable than measuring carbon quantity changes over a longer period of time (at least a decade). For a market that pays farmers annually, this presents a problem. The methodologies for measurement need to be verified by a trusted, independent third party or against a formal standard. There is a lot of innovation in this space with a number of emerging technologies looking to achieve accurate measurement for a more affordable price.

■ **Additionality:** In order to be a legitimate carbon offset that can be sold within a private market, the carbon offset must prove additionality. Additionality means the carbon would not have been sequestered in the absence of a market for offset credits. In other words, carbon income needs to be a key driver for the land use or management change that is generating the offsets – the project cannot be financially viable without carbon income. This means deriving carbon income from a commercially viable regenerative agricultural business can be difficult to justify, which is clearly a significant barrier to the future of the soil carbon market, particularly as our understanding of what is financially viable begins to incorporate environmental values. The nebulous nature of the "additionality test" means that this topic currently lacks clarity and requires an agreed upon and standardised approach.

Soil carbon sequestration has a role in reducing atmospheric carbon in the short to medium term, until industries (including agriculture) are able to fully decarbonise. While there are many good reasons for farmers to increase soil carbon, carbon trading for profit might be an added bonus for those looking to alter their farming practices, as opposed to the driving factor.

METHODS OF STORING CARBON IN SOIL



Min or zero till



Cover cropping



Intercropping



Ley/arable rotations



Crop residue retention



Agroforestry

👉 It is important to recognise the difference between purchasing land for commercial carbon offset creation versus investing in rural assets that already sequester carbon 👉

\$140

Sweden doesn't have a market for soil carbon, but a polluter is taxed \$140 per tonne of CO₂e

1/3

The proportion of arable acres in Alberta estimated to be farmed under the soil carbon protocol



International soil carbon schemes

We look at the initiatives around the world that reward climate-friendly farming practices

Efforts to develop soil carbon markets continue around the globe, with some of our core Global Farmland Index countries leading the way. We analyse here various national schemes attempting to address the issues in the market.



UNITED STATES OF AMERICA

In 2021, the Growing Climate Solutions Act passed through the Senate and, at the time of going to print, is expected to pass through the House of Representatives. This legislation is designed to make it easier for farmers to sell carbon credits by directing the US Department of Agriculture (USDA) to create a certification process for third-party experts to help farmers verify the credits they generate.

For years, organisations known as carbon offset

registries — such as Climate Action Reserve and American Carbon Registry — have worked with scientists, companies and environmental NGOs in an effort to create effective markets by developing detailed protocols, such as the Grassland Protocol. This protocol is for verifying emissions reductions associated with the avoided conversion of grassland to arable, rewarding farmers for protecting grassland while allowing the land to be grazed and fertilised organically.

While these protocols are thorough, paired with transaction costs, they are expensive for farmers to implement. One company attempting to address this is Nori, which uses third parties to verify the credits. It has created its own protocol and offers farmers a 10 year contract. Nori also allows individuals to buy carbon offsets by the tonne to offset the carbon they generate by flying, for example.



CANADA

Since 2019, every jurisdiction in Canada has had a price on carbon emissions. Canada's approach is flexible: any province or territory can design its own pricing system tailored to local needs, or can choose the federal pricing system, known as the Carbon Pricing Backstop. The scheme is a combination of a carbon tax (for fossil fuels) and an emissions trading component for industrial facilities emitting above certain thresholds. Earlier this year, the federal scheme put forward proposals for an Enhanced Soil Organic Carbon protocol although some provinces, such as Alberta, already operate a soil carbon offset system.

The Conservation Cropping Protocol is an example of a programme in Alberta, which provides opportunities for farmers to earn carbon

👉 Canada's approach is flexible: any province or territory can design its own pricing system tailored to local needs, or can choose the federal pricing system, known as the Carbon Pricing Backstop 👉

“Companies need to invest in decarbonisation as a first port of call, not purchasing credits as a green washing exercise”

offsets by increasing soil carbon levels through no-till management and reducing greenhouse gas emissions from lower fuel use. It is estimated that over a third of the arable acres in Alberta are farmed in line with the protocol, sequestering 600,000 to 700,000 tonnes of carbon per year.



AUSTRALIA

Australia boasts a robust soil carbon market with an established government-backed marketplace and a regulated, empirical measurement methodology. The country adopted a national Carbon Pricing Mechanism and an emissions trading scheme in 2011 and, to run concurrently, set up the Carbon Farming Initiative (CFI). The CFI was the first nationwide example of carbon credit creation and trade mechanism by the agriculture and forestry sectors to a wider market.

In 2014 the Carbon Pricing Mechanism was replaced with the Emissions Reductions Fund (ERF), which works on a reverse auction model. Carbon Farming projects bid their carbon mitigation/avoidance strategies, detailing the total operational cost, and the most cost-effective projects are subsequently bought at auction. Although transition to the ERF has led to substantial decreases in the price of carbon (from approximately \$23 AUD to approximately \$12 AUD per tonne CO₂e), contracts granted to farmers are more economically stable and so favourable, providing steady incomes over longer periods of time. As of October 2020 more than 85 million carbon credits, each equivalent to a tonne CO₂e, have been issued.



EU

Early in 2021, The Farm to Fork Strategy included a new EU Carbon Farming Initiative that will be launched at the end of the year. The initiative will reward climate-friendly farming practices, via the Common Agricultural Policy or through other public or private initiatives linked to carbon markets. The Farm to Fork Strategy also establishes that the EU Commission will develop a regulatory framework for carbon credits.

Until this feeds through, offset schemes exist voluntarily. One such scheme is Soil Capital Carbon, which claims to be Europe's first certified multinational scheme, currently involving farmers from the UK, France, and Belgium. The firm measures the on-farm greenhouse gas balance, rewarding farmers who reduce their carbon emissions as well as sequester carbon.

Soil Heroes, a Dutch startup, has pilot projects across Europe. The firm focuses on farmer to purchaser relationships, enabling the purchaser to invest in a range of ecosystem services derived from regenerative agricultural practices. The ecosystem services are measured and verified by Soil Heroes, using a baseline measured by an independent party.

Observations on an emerging market

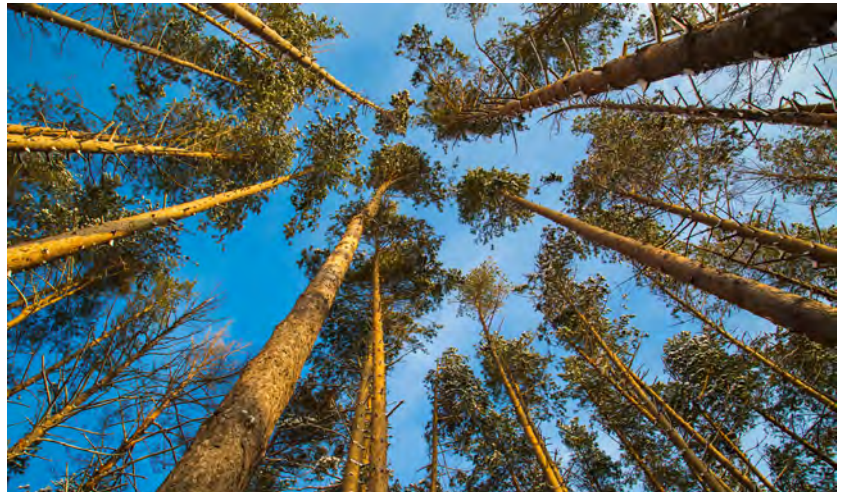
Standardisation, innovation and investment

A recurring issue is that the costs associated with accurate measurement of soil carbon mean that it is currently prohibitively expensive for some land managers to enter the market. Without improved technology and innovation to tackle this problem there is a risk that companies could sell credits without scientifically-assured evidence that carbon has been sequestered. The private marketplace may enable and encourage the innovation that is required, but it remains a risk that with so many emerging companies, all with differing approaches, the lack of standardisation will undermine the legitimacy of the soil carbon market as a method of tackling the global climate crisis.

Microsoft recently announced an investment of 193,000 tonnes in two soil carbon projects in Australia and America.

In their recent report on carbon removal, the investment falls within their short term natural solutions and they state that an ideal soil project includes baseline and verification in-soil sample measurements to supplement modelling, aiming for 30–50cm depth in the long term. Furthermore, the project should demonstrate distinct and measured tallies of removal and avoided emissions. The company acknowledged that the market is relatively immature and that measurement is expensive, but their decision to support the market is indicative of its importance and potential.

Ultimately, companies need to invest in decarbonisation as a first port of call, not purchasing credits as a green washing exercise. Offsetting is the answer to tackling residual emissions only.



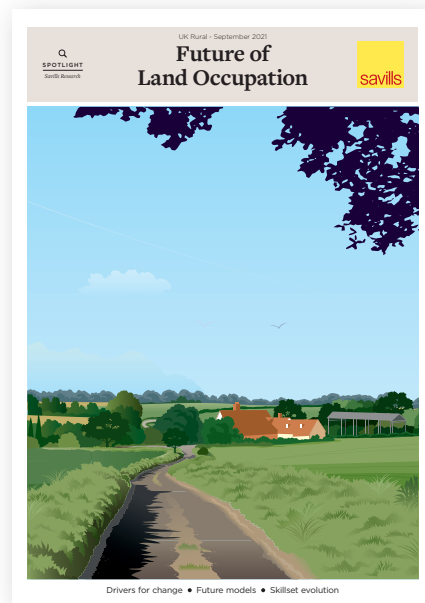
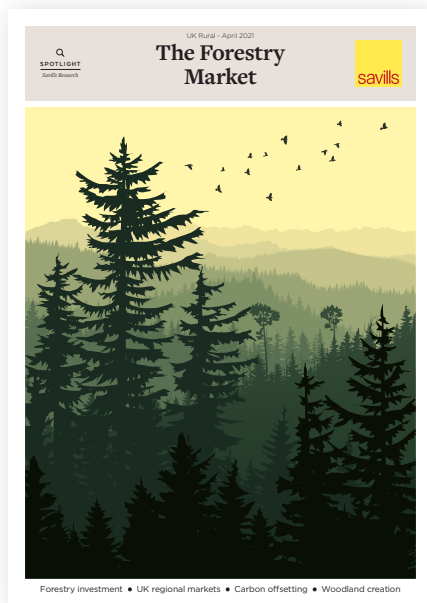
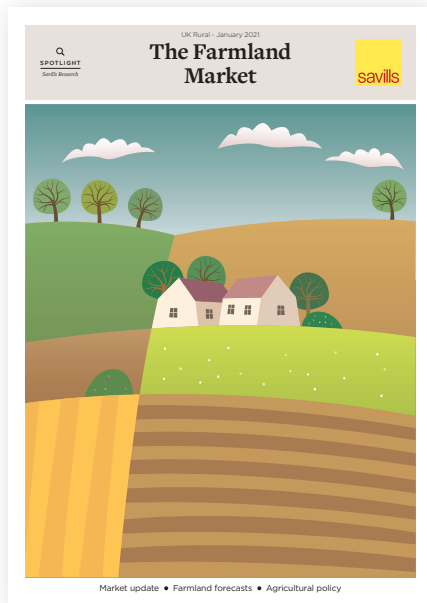
DIFFERENT APPROACHES

Sweden doesn't have a market for soil carbon but operates one of the highest carbon tax regimes in the world, with a polluter paying approximately \$140 per tonne of CO₂e. While agriculture is excluded, this tax has facilitated substantial reductions in emissions across

the country, with total emissions to 2010 being the equivalent of the level in 1960, despite national population growth.

In 2008, British Columbia in Canada introduced a carbon tax on all fossil fuels bought or combusted except ship and aircraft fuel. The fact that some agricultural inputs, such as diesel, were included, sparked fears that farmers in

that region would be uncompetitive. At the start the tax rate was \$10/tCO₂e, representing an increase of 2.69¢/litre of diesel; and increased to \$30/tCO₂e, equivalent to 7.67¢/litre. The tax was amended in 2012 to allow agriculture as an exemption, but a later study found no credible link between impact on agricultural trade and the carbon tax.



Savills Research

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