JLL Agribusiness

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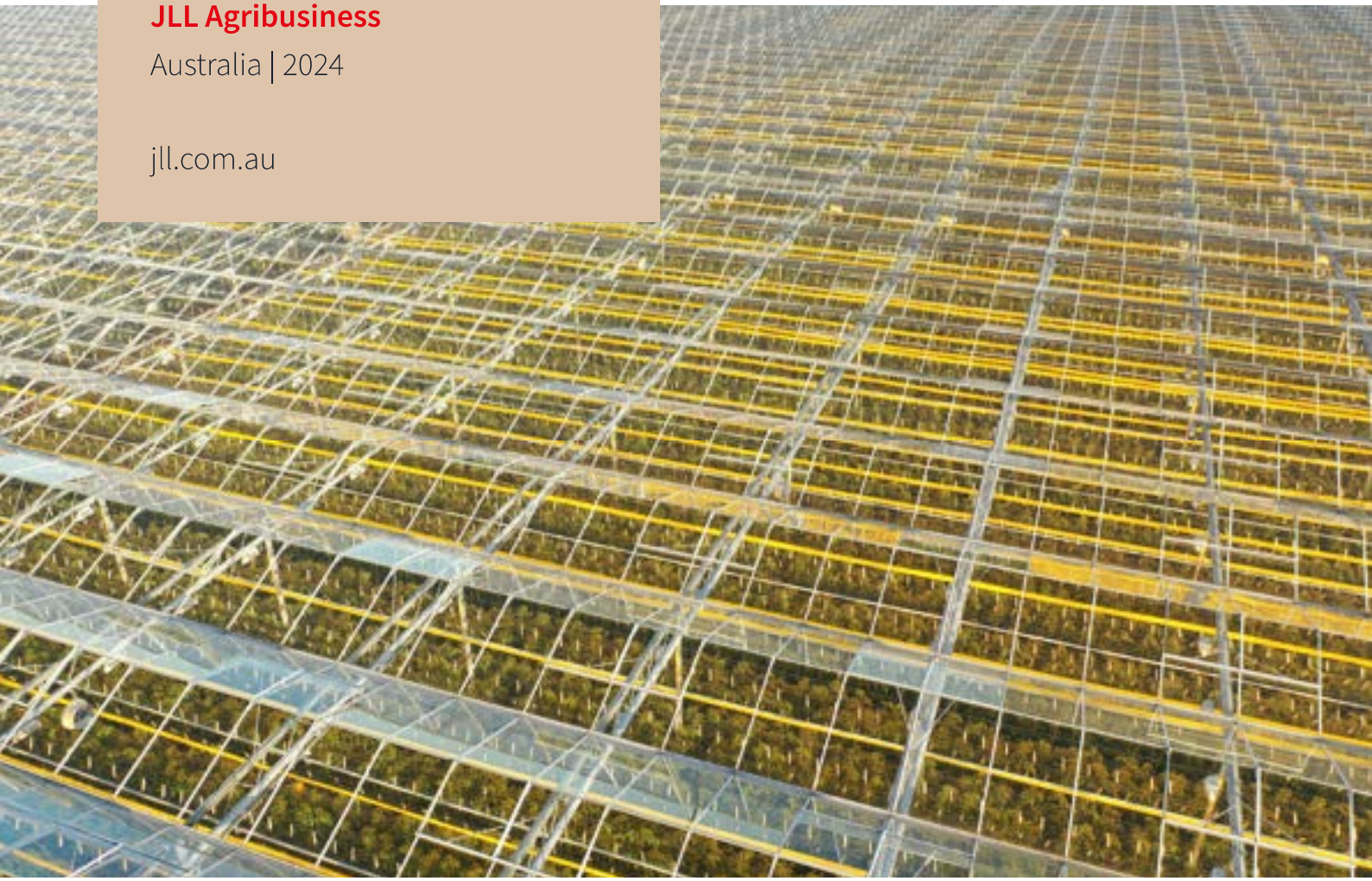


Agriculture, your next investment move

JLL SEE A BRIGHTER WAY

Introduction

Amidst persistent inflation, increased stock market volatility, and the enduring effects of the COVID-19 pandemic, investors are actively seeking alternative investment opportunities to diversify and enhance their portfolios.

With ongoing supply-chain hurdles, fluctuations in consumer demand, volatile commodity prices, and the potential for a structurally higher interest rate environment, investors must assess the shifting economic conditions and develop strategies to adapt to this changing environment.

Notably, high-net-worth individuals, investment funds, pension funds, and sovereign wealth funds are expressing a keen interest in stable, inflation-resistant investments, with agriculture emerging as a favoured option.

This report aims to explore the potential of investing in the Australian agricultural market, analysing its current status, prospects, and challenges.

Executive summary

The Australian agriculture sector holds significant value, standing at approximately AUD $3.6 trillion, making it the second-largest real estate sector in the country. With institutional ownership lagging behind commercial real estate, there lies a promising opportunity for investors.

The sector has several key demand drivers, including the growing global population, escalating calorific demands, impact of urbanisation on food production, and technological advancements.

Moreover, the influx of capital into alternate real estate sectors, including agriculture, presents a favourable investment environment, particularly as the core principles of ESG (Environmental, Social, and Governance) are deeply ingrained in agriculture, aligning with global initiatives towards sustainability.

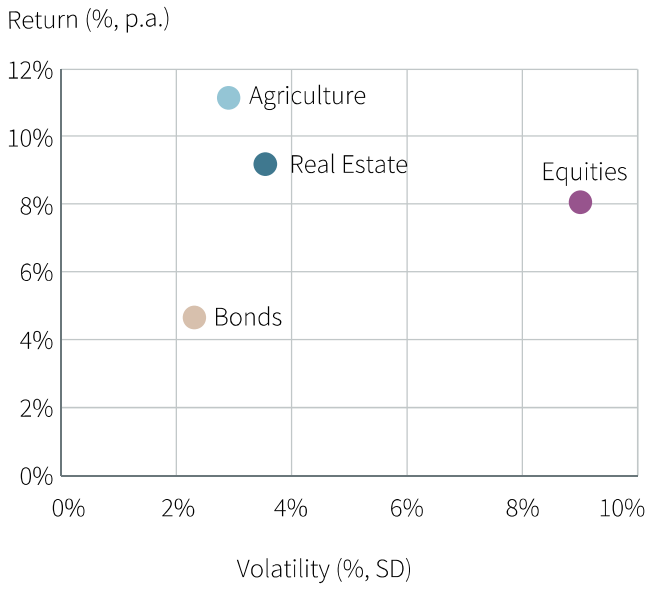
Investing in agriculture:

In the face of persistent inflation and heightened stock market volatility, investors are actively seeking alternative investment opportunities that can outperform traditional asset classes. The aftermath of the coronavirus pandemic has brought about enduring supply-chain challenges, surging consumer demand, volatile commodity prices, and a potentially structurally higher interest rate environment.

As investors consider the changing economic landscape, they must think and strategise about whether this represents a new normal for the global economy and what that means for their existing investments. Many high-net-worth individuals (HNWIs), investment funds, pension and sovereign wealth funds are expressing a keen interest in stable, inflation-resistant investments, and agriculture may emerge as a favoured choice.

Figure 1

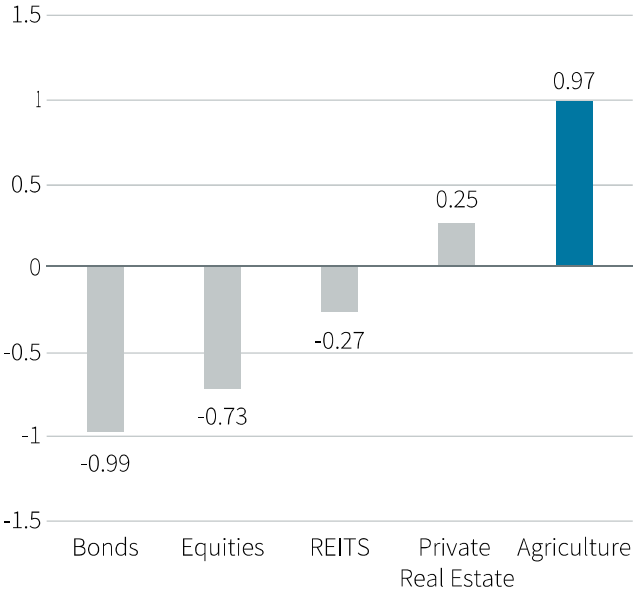
U.S. Sector Returns vs Volatility



Source: S&P, NCREIF, JLL Agribusiness

Figure 2

US Sector Correlation to Inflation

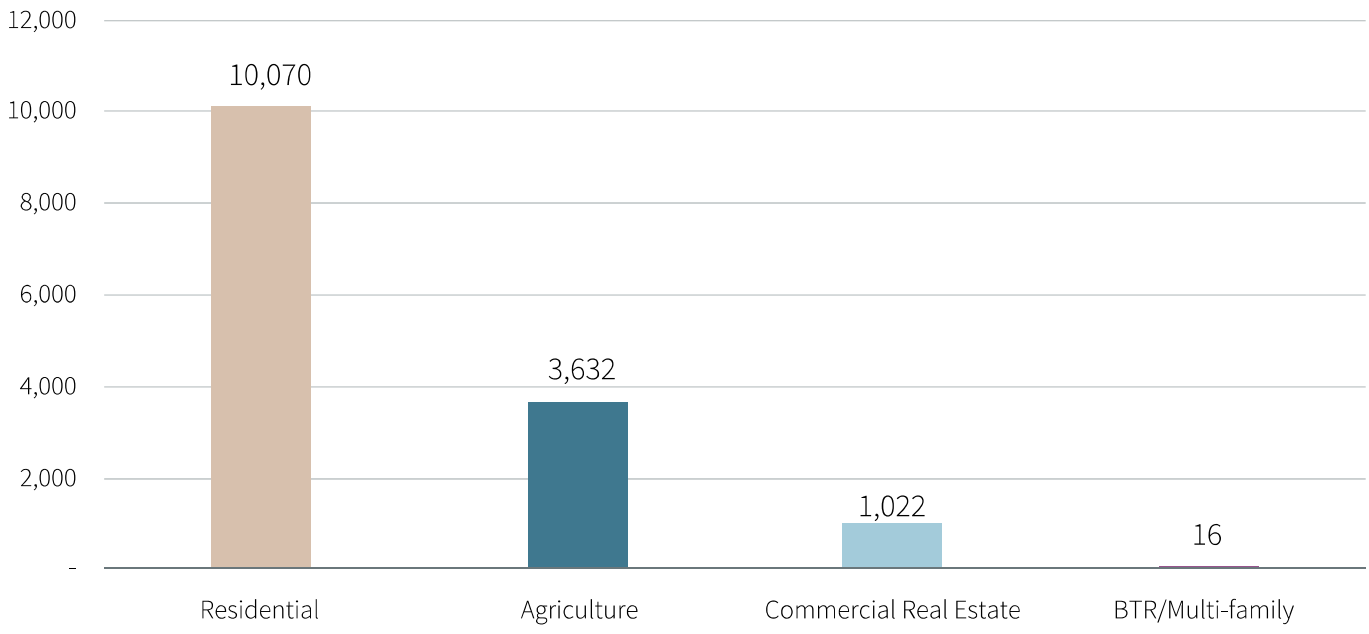


Source: S&P, NCREIF, JLL Agribusiness

Sizing up the Australian agriculture market

Figure 3

Market Size (AUD b)



Source: ABS, DAFF, JLL

Australian agriculture sector's value is approximately AUD $3.6 trillion and is the second largest real estate sector in Australia.

To put that into perspective, the value of the Australian agricultural land is 50% more than the total market capitalisation of all listed companies on the ASX and is marginally higher than the total superannuation savings of Australia (AUD $3.5 trillion).

Moreover, institutional ownership within the sector is significantly less than commercial real estate and therein lies the opportunity.

The demand drivers

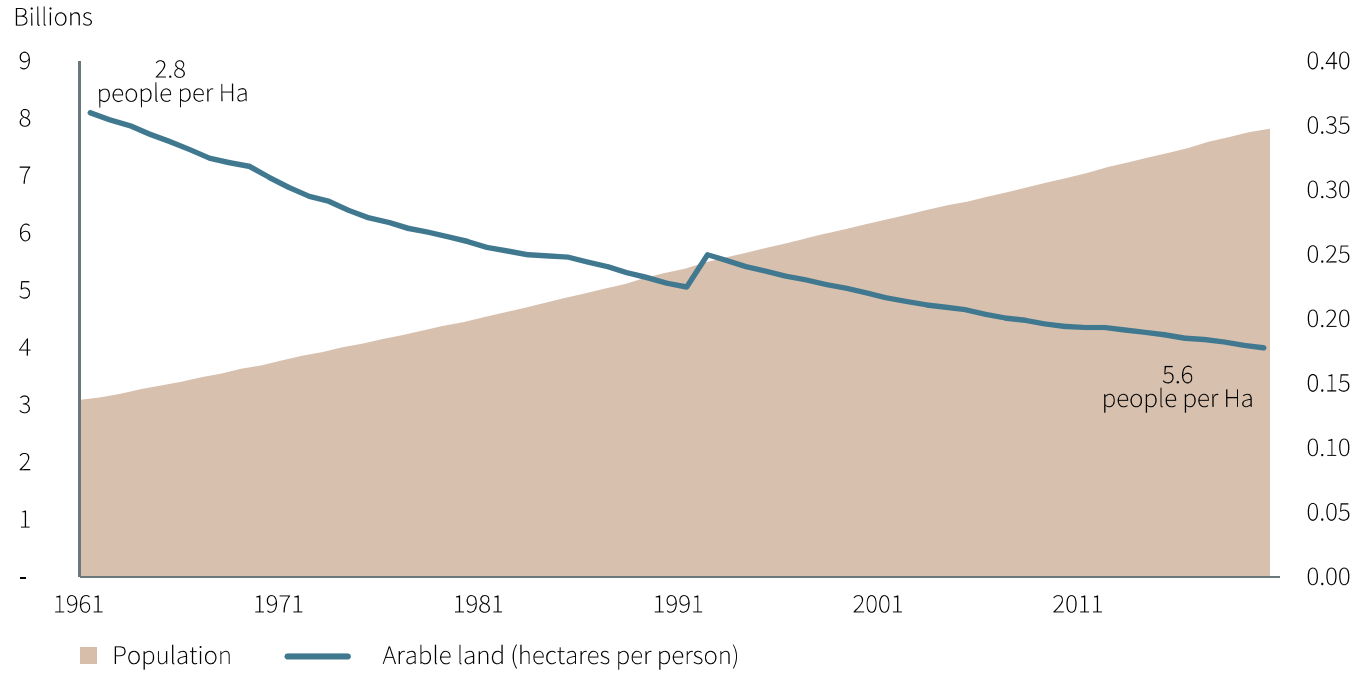
Growing global population

The global population has increased from 3 billion in the 1960s to over 8 billion as of today. In terms of farmland, the average hectare of agriculture land that once fed on average 2.8 people is now supporting 5.6 people.

Moreover, the United Nations Food and Agriculture Organisation (FAO) predicts that, by 2050, the world's population will exceed 9.7 billion. That translates to a growth of 20%, or 0.76% p.a. which will help underpin the next wave of investment in agriculture.

Figure 4

Global Population vs Farmland



Source: World Bank, JLL

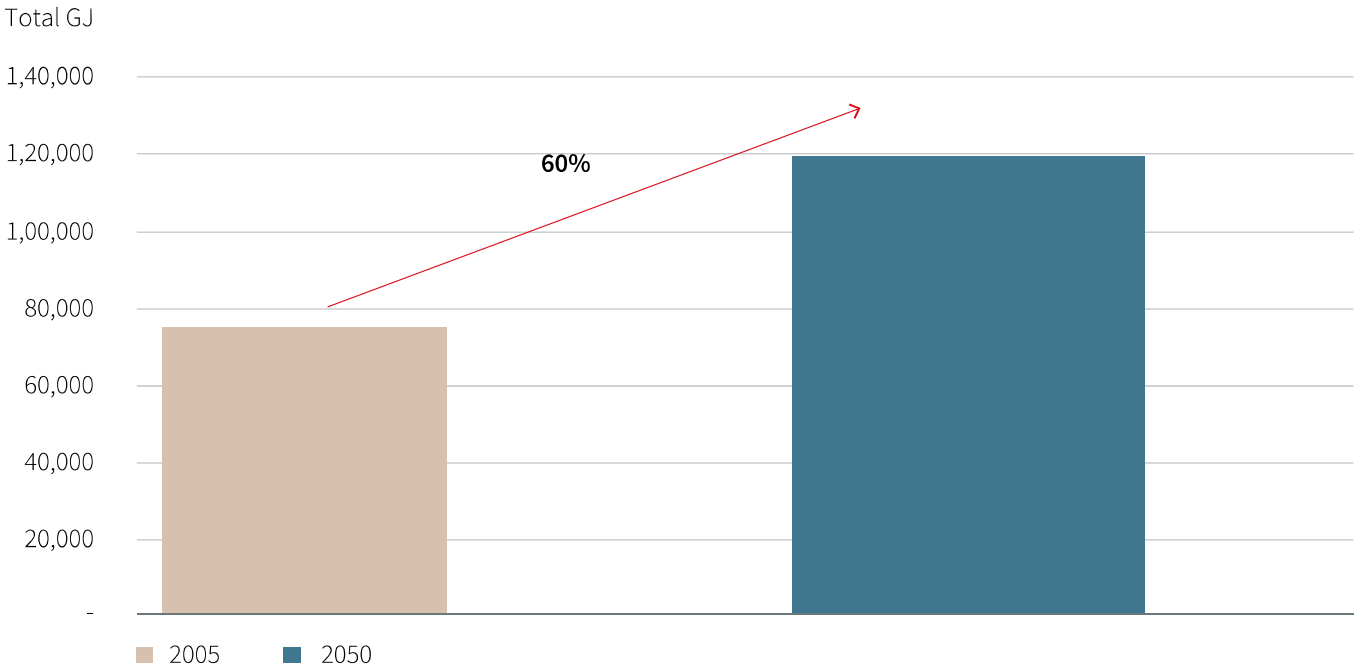
Calorific demand per person on the rise

Beyond population growth, a significant catalyst for increased demand in the agricultural sector is the escalating per-person demand for calories. This surge is influenced by various factors, including a richer diet in both developed and emerging nations like China and India, coupled with ongoing efforts to reduce poverty.

The overall estimate by the FAO indicates that calorific demand is projected to witness a substantial 60% increase.

Figure 5

Global Calorific Demand



Source: FAO, JLL Agribusiness

Peak agriculture land

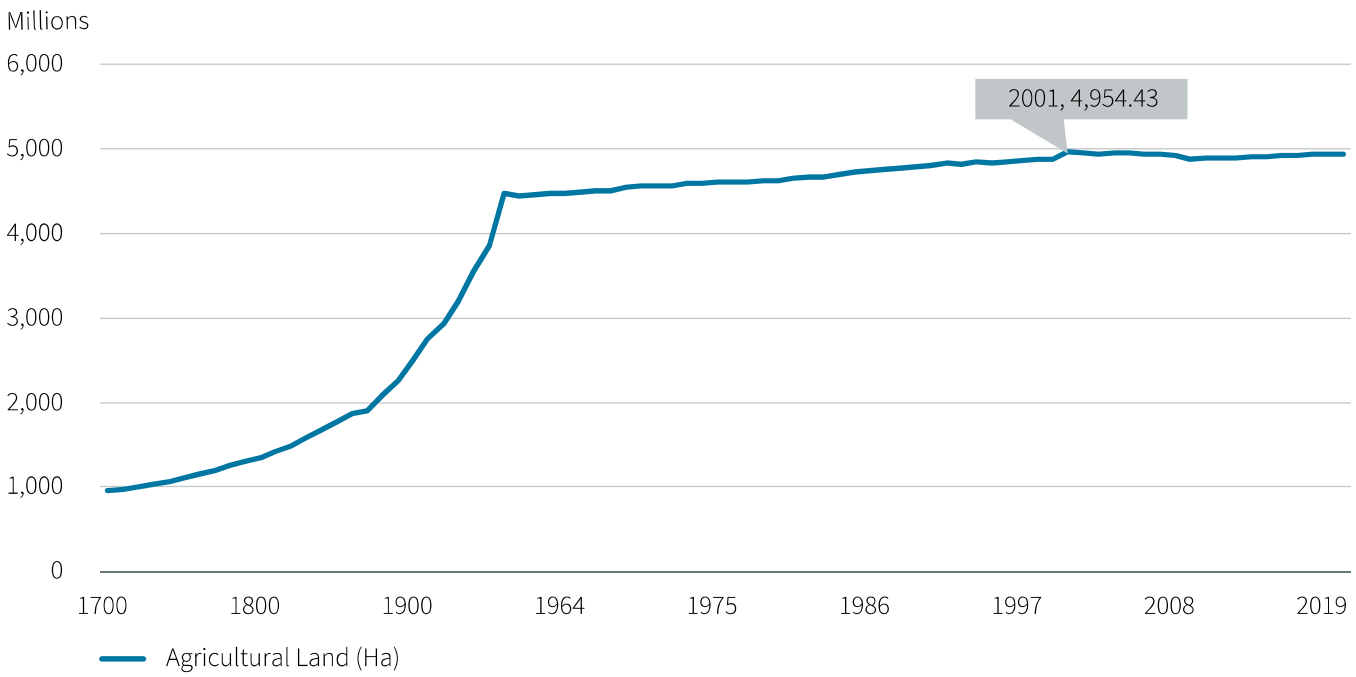
For centuries, humans have converted natural landscapes into farmland to sustain their needs. This ongoing transformation has witnessed natural land giving way to agriculture, driven by the substantial rise in the global population and affluence.

Numerous comprehensive studies have been conducted to assess the expansion of agricultural land, and while the specific figures may vary, the overall trends remain consistent.

Notably, major studies converge on the conclusion that the world likely reached peak farmland around the turn of the last century. According to FAO, in 2001, the total agricultural land was estimated at 4,954 million hectares, and each subsequent year has seen this figure decline.

Figure 6

Global 'peak' in agriculture land may already have passed



Source: FAO, JLL Agribusiness

Increased urbanisation

The ongoing trend towards increased urbanization is set to continue. World Bank forecasts that nearly seven out of ten people will reside in cities by 2050, therefore, urbanisation will continue to transform the food production system. The transformation brings both challenges and opportunities.

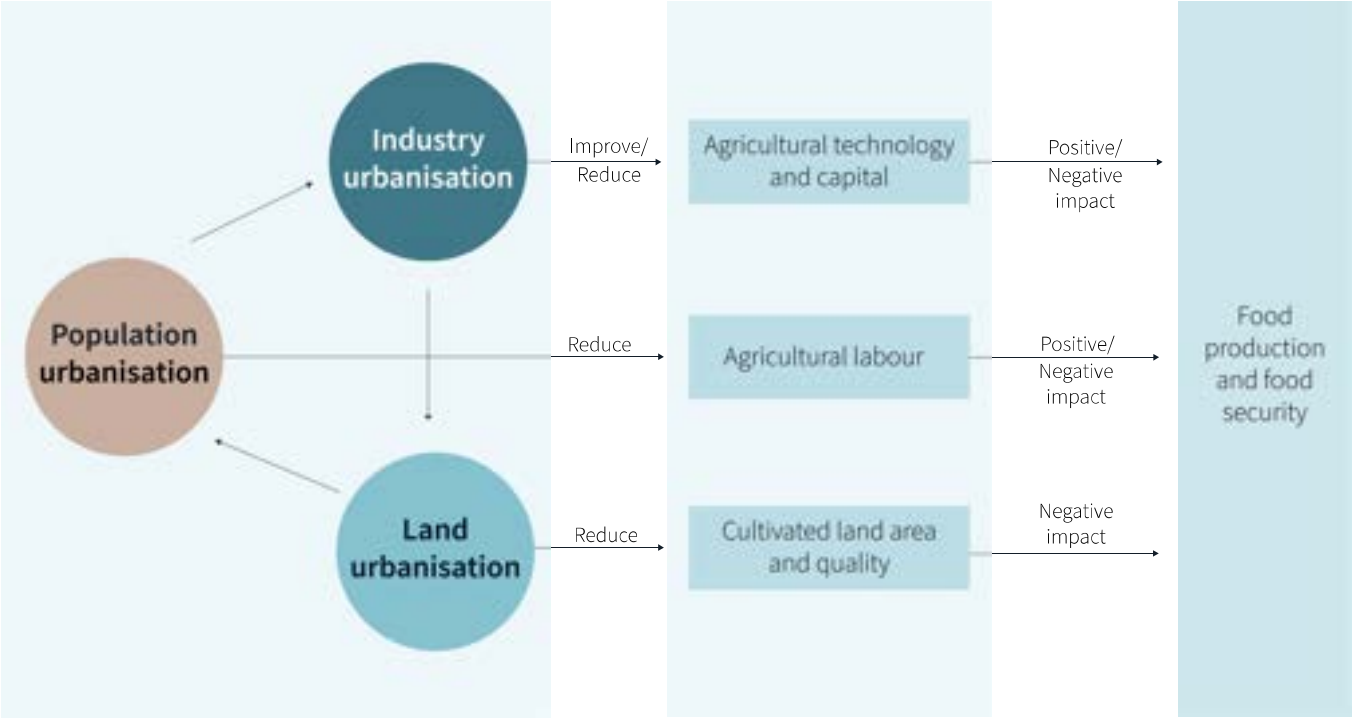
There are plenty of challenges that come with urbanisation, none more important than the loss of quality land on the periphery of the urban sprawl. Adding to this are the dietary changes that occur with increased urbanisation as the heightened availability of inexpensive, convenient, ready-made meals and fast foods contribute to malnutrition.

Diametrically opposite, there is also an inadequacy in the availability of fresh and affordable produce, making it harder for impacted individuals to meet the daily dietary requirements for optimal health.

However, urbanisation also offers opportunities by fostering long and more complex supply chains. This, coupled with further investment in productivity enhancing strategies and the sheer urban proximity to rural regions, helps facilitate improved access for farmers to innovative agricultural inputs and services.

Figure 7

Urbanisation process



Source: MDPI

Productivity in agriculture

One of the forgotten 'wonders of the world' has been the application of science and technology to improve the productivity of the agriculture sector. The Yin-yang relationship between agricultural productivity and global population goes back millennia and the trend will have to continue if the world has any chance of feeding the demand for food for a growing and rising affluence.

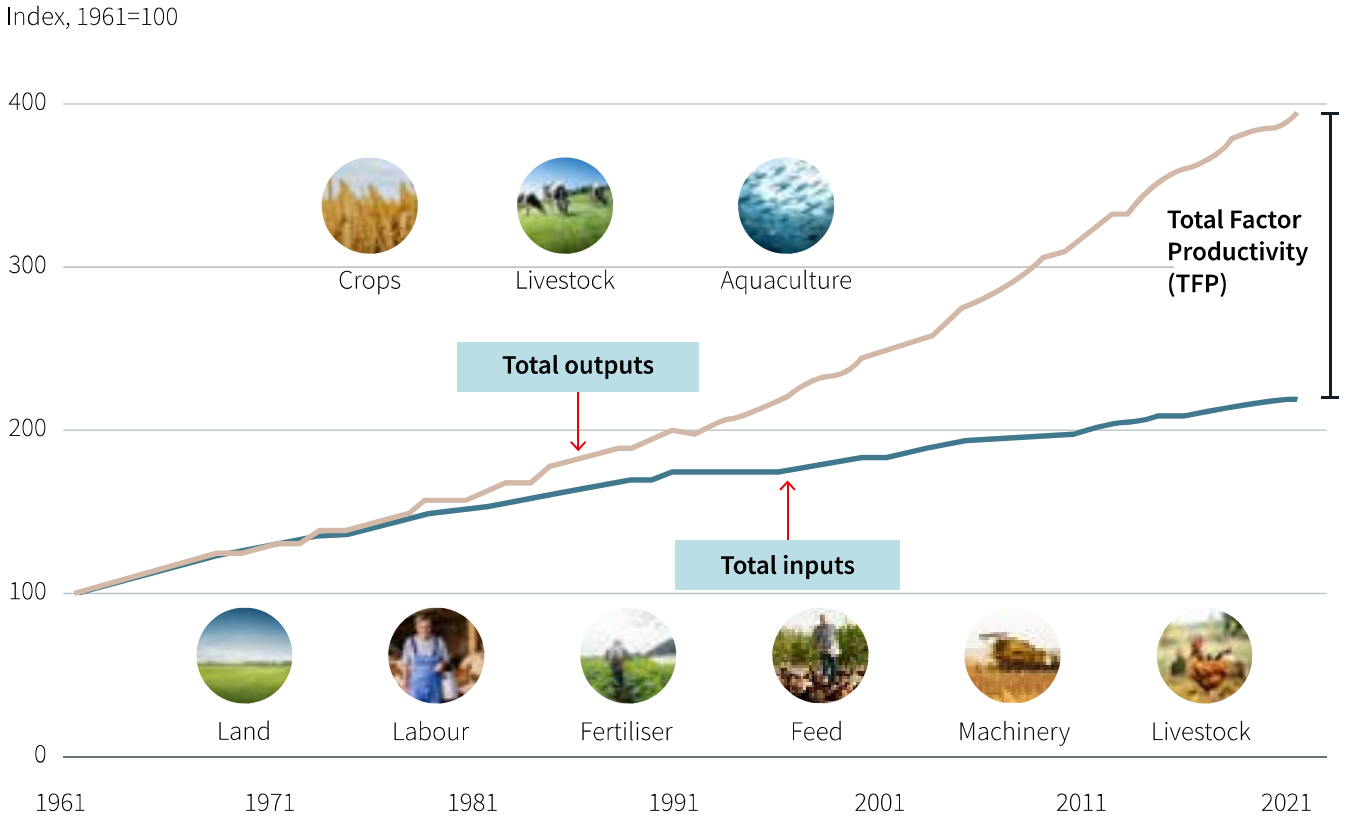
Total farm production has quadrupled over the last six decades even as land and labour used in farming declined.

Innovations in animal and crop genetics, use of chemicals, equipment, technology and scaling up of farming enterprises have enabled continuing growth in farm output.

The total factor productivity (i.e. the quantity of output produced with a given quantity of inputs) was responsible for two-thirds of the overall gain in output.

Figure 8

Total Factor Productivity



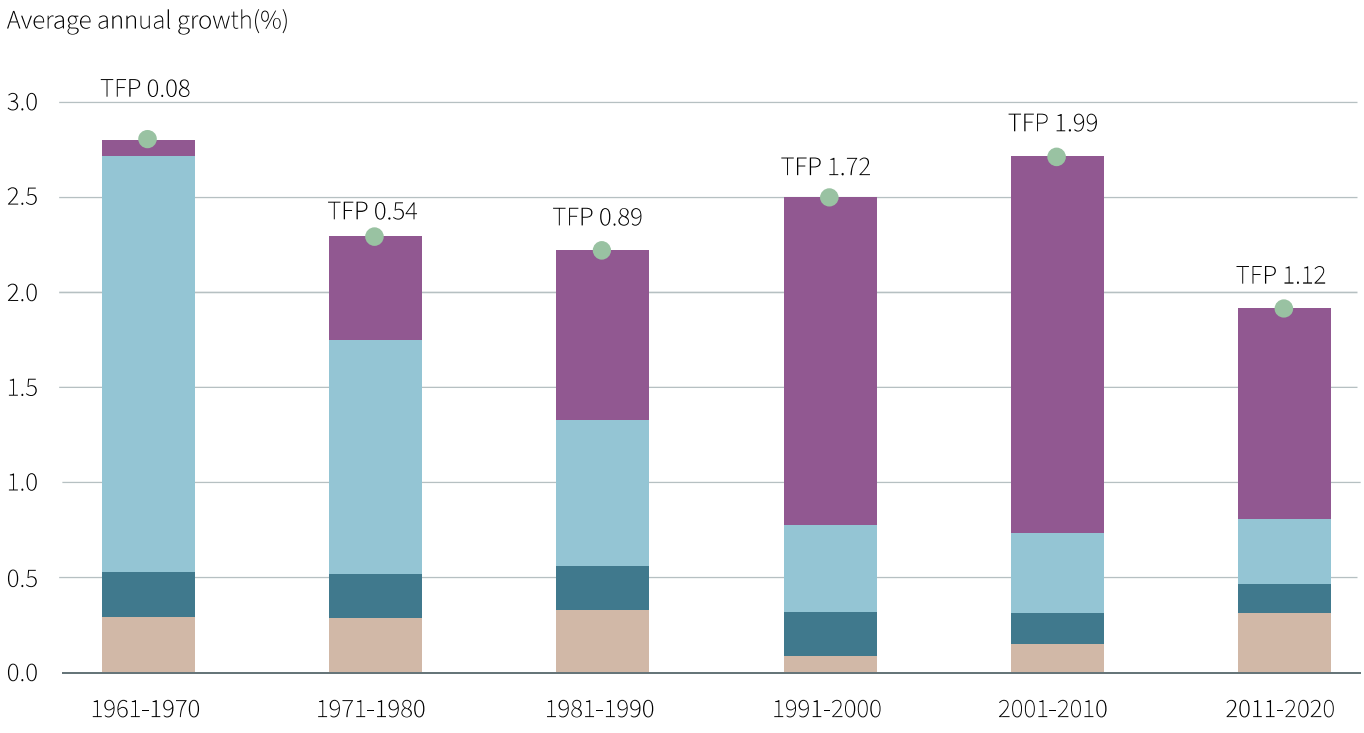
Source: USDA

Given expansion of agriculture land is no longer possible in most parts of the world, technology and evolution in scientific thinking will once again be required to meet the ever growing demand for food.

There is tremendous opportunity in the application of technology to increase productivity, especially in a country like Australia where the scale of farming enterprises, their remoteness and lack of qualified labour will ensure faster adoption of technology than other countries.

Figure 9

Decadal Productivity Growth



Land expansion - Extending agriculture to previously forested areas or grasslands.

Irrigation extension - Extension of irrigation to agricultural land.

Input Intensification - Gross amount of labour, materials and capital used per hectare of land.

TFP - Gross amount of crop, livestock and aquaculture products produced per inputs of labour, materials, and capitals.

Output growth - The change in the gross amount of crops, livestock and aquaculture products produced.

Source: USDA

Technology in agriculture

Over the decades, technological advancements in agricultural production has allowed for a rapid increase in scale, speed, and productivity through incremental developments in genetics, irrigation, and fertilisers.

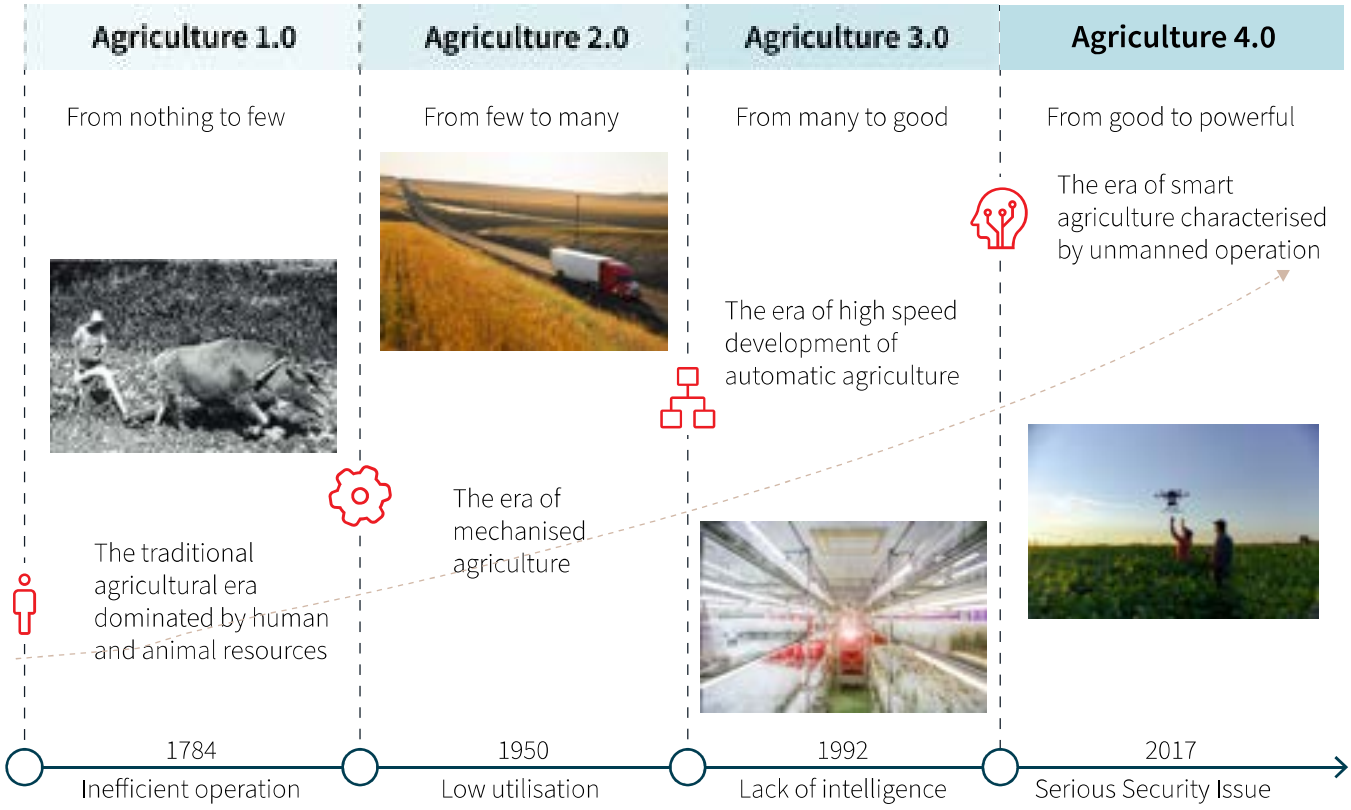
Agriculture is now at the forefront of a new revolution, Agriculture 4.0, that is aligned with the broader fourth industrial revolution, Industry 4.0. This paradigm shift is fuelled by data and connectivity, incorporating emerging technologies such as artificial intelligence, analytics, connected sensors and cloud computing.

These innovations hold the potential to enhance yields, optimise resource utilisation, and foster sustainability across various agricultural sub-sectors.

As already outlined, the future challenges in agriculture remain substantial – the world will need 60% more food while simultaneously needing to reduce the energy, pesticide, fertiliser, water usage, and greenhouse gas emissions involved in production. Addressing these challenges is likely to involve the integration of precision technologies, utilising robots, GPS, and remote sensors to apply inputs precisely on a 'where needed' basis in the fields.

Figure 10

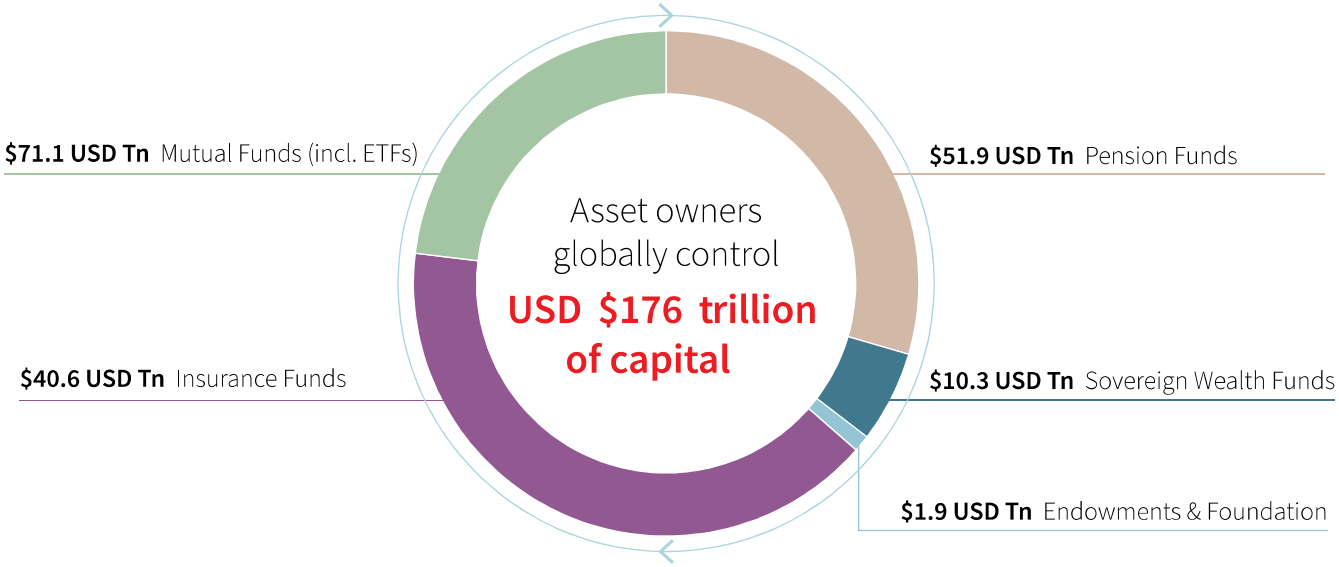
Technology in Agriculture



Source: IEEE, CAA Journal of Automatica

Tsunami of capital

The global capital market has never been larger, more dynamic, diverse or powerful in its ability to shape the future wealth and policies of nations. Thinking Ahead Institute (TAI) estimates the global value of total capital at USD $176 trillion and is on track to be twice the size of the global GDP (estimated to be USD $105 trillion at present).

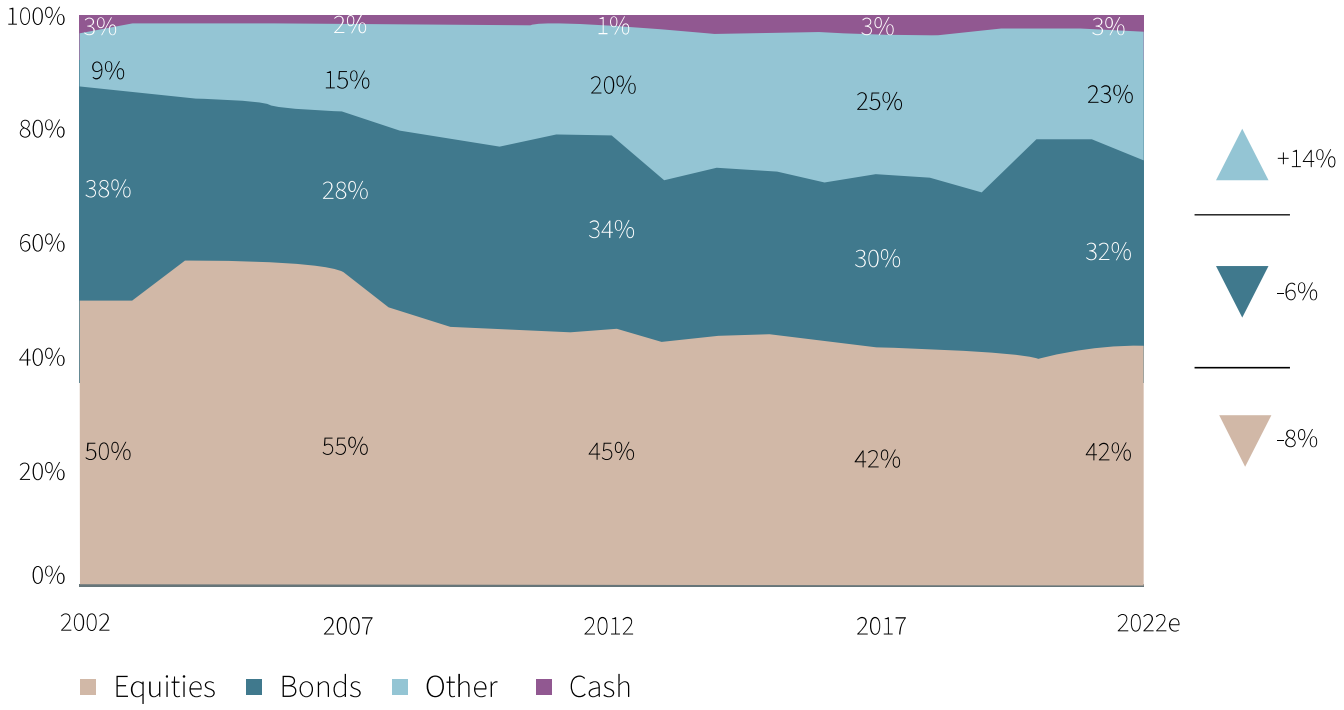


Source: Thinking Ahead Institute (TAI)

Moreover, the allocation towards asset class other than equities and bonds has increased by 14% over the last decade. Within this 'other' class is commercial real estate and alternate real assets such as agriculture. The increase in allocation towards other real assets will ensure a steady flow of capital that is looking for a home.

Figure 11

Aggregate Pension Fund Asset Allocation from 2002 to 2022



Source: Thinking Ahead Institute (TAI)

Growth of the alternate real estate sectors

As traditional real estate sectors (office, industrial and retail) mature, investors are increasingly focusing on allocating more and more capital towards the alternate real estate sectors.

JLL Research estimates that the total value of Australia's alternative real estate sectors excluding farmland was approximately AUD $235 billion in 2022, tiny compared to the market size of farmland.

Figure 12

Size of Alternate sectors

Rank	Sector	Size (AUD b)
1	Agriculture Farmland	**$3,600**
2	Aged Care	**$39**
3	Retirement	**$33**
4	Childcare	**$28**
5	Private Hospitals	**$25**
6	Data Centres	**$24**
7	Renewables	**$20**
8	Student Accommodation	**$17**
9	Built to Rent (BTR)	**$16**
10	Medical Centres	**$15**
11	Self-Storage	**$14**
12	Manufactured Housing (MHE)	**$6**
13	Life Sciences	**$5**
14	Specialist Disability Accommodation	**$4**

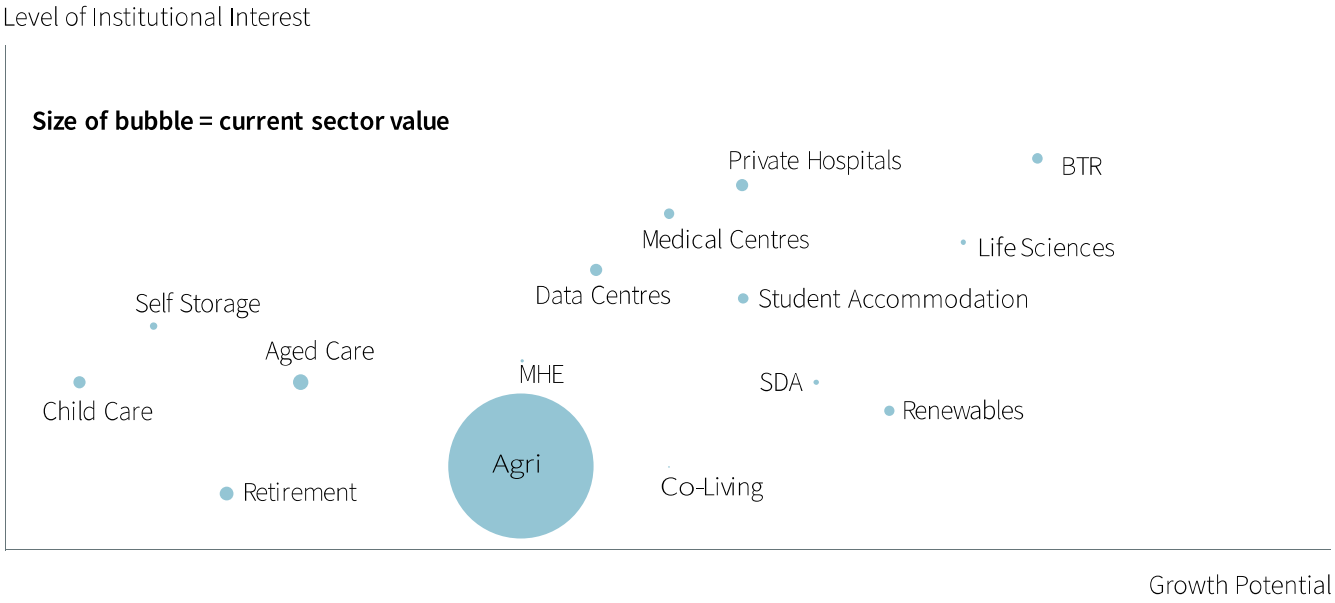
Source: JLL Agribusiness, JLL Research

Even though each one of Australia's alternative sectors present a compelling proposition for investors, because of the smaller sizes of the various alternative sectors, institutional investors struggle to strategies and invest due to the lack of scale.

In stark contrast, agriculture is one of the very few alternate sectors that offers institutional investors the scale at which they would find it worthwhile to invest in.

Figure 13

Size of Alternate Sectors



Source: JLL Agribusiness, JLL Research

ESG

Long before ESG became an everyday lexicon, the world via The United Nations (UN) had pledged and committed itself to ending hunger by 2030. Although progress has been made, the world is far from meeting this pledge with over 800 million people going hungry every day even today.

The onus of this pledge has fallen on farmers, given they are responsible for providing the products that ultimately achieve this goal. This is an enormous responsibility that is relatively out of their control given that nature can dictate the viability of crops from season to season.

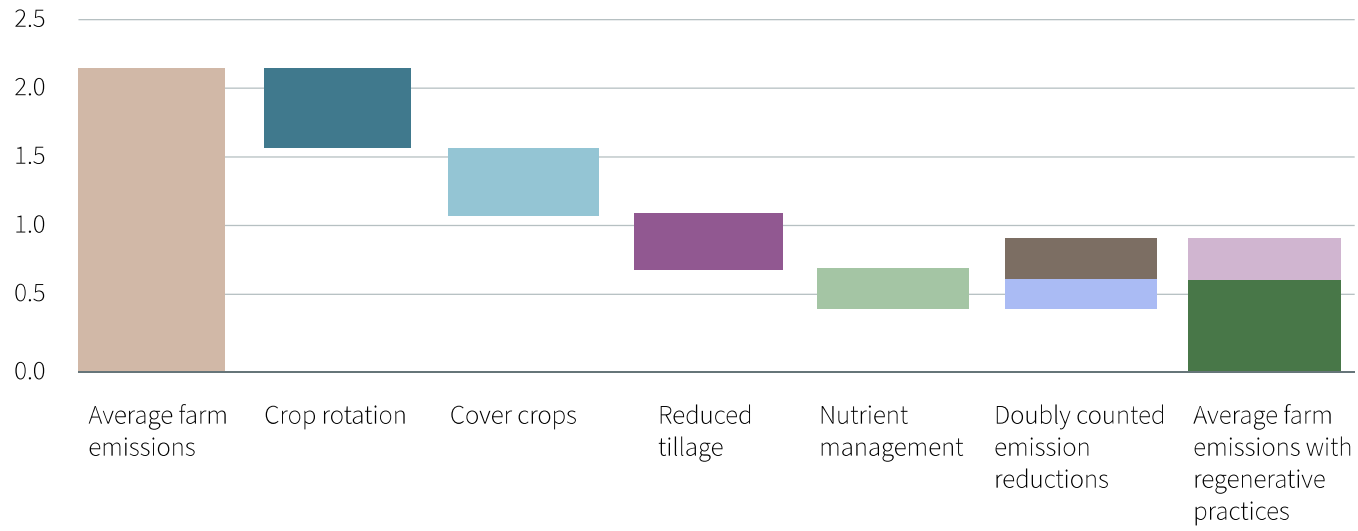
Therefore, the principles of ESG are enshrined in the rich history of agriculture as well as modern farming practices that enhance the productivity within the sector. Nonetheless, the virtual global ESG mandate of Net Zero by 2050 will impact the sector in multiple ways, bringing both challenges as well as opportunities.

One such example was drawn out in a recent report by Bain Capital wherein they calculated the costs involved and the potential breakeven point of a farm in Ontario, Canada that has to cut its emissions in half. The study showed that the upfront costs required to achieve the lowering of emissions would require four years to break even which is a minimum of 8 crop cycles.

The costs may be bearable for a large farming enterprise, however, to put capital at risk and face eight crop cycles in a physical environment which has become more challenging is potentially a bridge too far for most producers in our opinion. Most farmers will need financial incentives and support if they are to adopt such strategies or higher commodity prices.

Figure 14

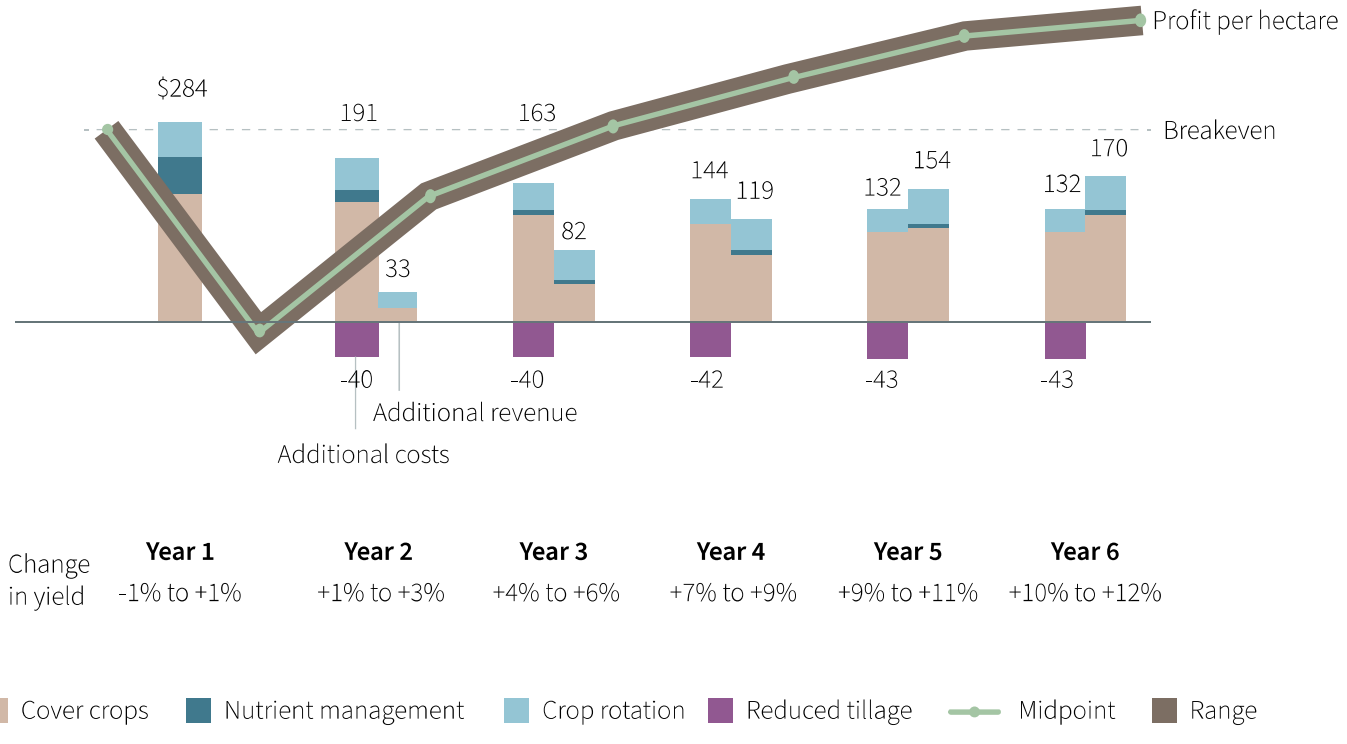
Average annual farm emissions, in metric tons of carbon dioxide equivalent per hectare



Sources: Nature United, Master NCS Report, 2021; USDA EQIP Practice Scenarios; USDA EQIP Incentives; US Soil Health Partnership

Figure 15

Profit or loss (per hectare, in USD)



Sources: Nature United, Master NCS Report, 2021; USDA EQIP Practice Scenarios; USDA EQIP Incentives; US Soil Health Partnership; Bain & Company

Conclusion

As investors navigate the shifting economic landscape, agriculture stands out as a resilient and promising investment avenue amidst market uncertainties.

The sector's growth potential, driven by global population trends, technological advancements, and increasing capital inflows, positions it favourably for long-term investment strategies.

Furthermore, the sector continues to embrace ESG principles and leverage innovative technologies for sustainable growth and meeting global food demand challenges.

Overall, we remain confident that unlike many other industries and sectors that are facing significant headwinds in terms of demand drivers, the fundamental demand drivers for agriculture remain robust.

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JLL Agribusiness

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Our team of experts is impartial and driven to add value to your business. More than that, our expertise is backed by over 150 years of combined rural and agribusiness experience.

Our team has a diverse background across a wide range of market sectors including broad-hectare grazing, cropping, irrigation, water markets, horticulture, viticulture, aquaculture and intensive production systems.

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