Capital requirements of Australia’s agriculture, fisheries and forestry sector
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In submitting this report, the researcher has agreed to AgriFutures Australia publishing this material in its edited form.

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Capital requirements of Australia’s agriculture, fisheries and forestry sector
The ability to attract sufficient capital to support industry consolidation, farm turn-over, and growth-oriented investment is critical for fuelling growth to drive towards this target. However, if the sector is to achieve its potential, Australia must find answers to questions about how much capital is needed and where it will come from.

This report, undertaken by Natural Capital Economics (NCEconomics), explores the current investment gap by analysing the amount of capital required for the sector to reach the $100 billion goal. It also highlights opportunities to attract investment into the sector, including alternative avenues to traditional debt and equity finance.

Over the past decade, the level of capital investment has not been keeping pace with the consumption of capital. Findings from the report have estimated that net capital investment of $8.7 billion per annum is needed over the next 10 years to achieve the required growth. To put this into context, ABS data indicate that average annual net investment in productive capital in the sector has been approximately $1.2 billion over the past 30 years.

This gap is a significant problem for agriculture, fisheries and forestry industries as capital investment is key to lifting productivity and is needed at every stage of production – from machinery purchases, to land consolidation, to having the ability to change a property’s crop mix and even its fundamental use. Having access to efficient capital is the driving factor behind sustaining strong sector growth over the short, medium and longer term.

While a daunting challenge, bridging the investment gap needs to happen rapidly. It requires action from governments, industry, farm, fisheries and forestry businesses and the value chain to attract new capital to the sector, to reduce volatility and risk, and support growth.

The current and emerging demand for capital uncovered in this report, aims to give the sector critical information on the drivers, impediments and levers available to create greater investment opportunities in the sector. Critically, the report focuses on the knowledge gap and improvements needed to make the sector more attractive to domestic and international investors.

This report has been produced under AgriFutures Australia’s National Rural Issues (NRI) Program. Part of the National Challenges and Opportunities arena, NRI focusses on thought provoking and horizon scanning research to inform debate and policy on issues of importance across rural industries.

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Michael Beer
General Manager, Business Development
AgriFutures Australia

The National Farmers’ Federation has outlined a roadmap to grow the value of Australia’s agriculture, fisheries and forestry sector to $100 billion by 2030. From a base of just over $63 billion (2016-17), this ambitious target will require a more than 50% increase in the sector’s contribution to Australia’s gross domestic product (GDP).
The ability to attract sufficient capital to support industry consolidation, farm turn-over, and growth-oriented investment is critical for fuelling growth to drive towards this target.
About the author

Natural Capital Economics (NCEconomics) is part of the Alluvium Group and formed in 2016 to bring to the market national leading economists and social scientists working in the management of our natural and economic resources to achieve positive change.

Our business is focused on helping clients understand and resolve the most complex and pressing challenges related to climate change, energy and water resources, agriculture, waste and our natural environment.

Acknowledgments

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- Australian Meat Processor Corporation
- Australian Pork Limited
- Australian Sugar Milling Council
- Australian Wool Innovation
- Council of Rural RDCs
- Dairy Australia
- Duxton Capital Australia
- EAT Group
- Egg Farmers of Australia
- F & L Delahunty
- Fisheries Research Development Corporation
- Forest & Wood Products Australia Ltd
- Future Fund
- Grains Research Development Corporation
- Horticulture Innovation Australia
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- NAB Agribusiness
- Northern Australia Crop Research Alliance
- Pollination
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- Responsible Investment Association of Australia
- Rural Funds Management
- Suncorp

Their time and contribution to the overall analysis has been invaluable.
Our business is focused on helping clients understand and resolve the most complex and pressing challenges related to climate change, energy and water resources, agriculture, waste and our natural environment.
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Table 12  Australian headquartered investors focused on the agricultural fisheries and forestry sector (a selection of the largest investors) 98
The purpose of this project is to quantify the capital required over the next decade to support significant growth in Australia’s agriculture, fisheries and forestry sector.
The Australian agriculture, fisheries and forestry sector

The Australian agriculture, fisheries and forestry sector (the sector) is an important contributor to the Australian landscape, social fabric and economy. In 2018-19, the farm gate value of the sector was $69 billion or 2.2% of Australian gross domestic product (GDP).

In 2019, the National Farmers’ Federation (NFF 2019) published a report which outlined an ambition to grow the sector’s gross value of production (GVP) to $100 billion by 2030. Achieving growth of this magnitude will require significant capital investment. Investment that will underpin both enhanced production and higher prices via greater value-adding.

The purpose of this project is to quantify the capital required over the next decade to support significant growth in Australia’s agriculture, fisheries and forestry sector.

Growing pains

Achieving growth is challenging. Based on farmgate value, the sector’s gross value of production (GVP) has increased in real terms over the past 20 years, from $58 billion (1999-2000) to $69 billion (2018-19) or an average annual increase of 0.9% (ABARES, 2020a).

In real terms, the contribution of changes in volume and price that underpin this growth has been mixed over this time. In aggregate, changes in production (volume) have accounted for the greater proportion of the growth (ABARES, 2020a). The relatively low contribution to GVP from growth in prices is consistent with much of the output from the sector being sold on international markets, where the sector is largely a price-taker (ABARES 2019).

Maintaining historical growth levels is increasingly difficult, with the sector contending with a number of factors that serve to challenge its competitiveness relative to other nations. These include:

- **Constraints on natural capital asset base**, which limits the extent to which growth can come from an expansion of the area of land and water (in the case of fisheries).

- **Climate variability**, which is increasingly altering the sector’s product mix, creating opportunities and constraints.

- **Market variability**, especially for internationally traded products. Historically, agriculture has exhibited the highest index of volatility, ahead of finance and insurance (Keogh 2015).

- **Changing consumption patterns**, as per capita income increases in developing countries, this has implications for the food and beverages purchased in these markets.

With demographic change (and holding current market share and prices constant), we estimate the sector’s GVP could reach $78.4 billion (ranging between $74.3 – $82.7 billion) by 2030. To achieve growth closer to $100 billion will therefore require a significant step change in productivity, price and market share, which must be underpinned by capital investment.

Over the past decade the level of capital investment in the sector has not been keeping pace with consumption of capital.
Executive Summary

The sector has identified that growth will be achieved through a range of measures, including through greater access to financial capital, which supports growth by facilitating, for example:

- Expansion to achieve greater economies of scale both at an enterprise and industry level.
- Maintenance of high levels of quality assurance.
- Vertical integration of the supply chain.
- Adoption of new technologies.
- Removal of logistics constraints.
- Market access, especially to new markets.

The capital stock of the agriculture, fisheries and forestry sector (that is, the assets that underpin output, including machinery, buildings, and raw materials) has shown significant nominal growth over the past 30 years. The total value of the sector’s capital stock has been estimated at $505 billion in 2019 (ABS 2019). This includes land values. Over the past decade, broader investment in the sector has ranged between $10.6 billion to $13.2 billion per annum, averaging at $12.2 billion in real prices. While this may appear a healthy level of capital investment, it needs to be balanced against asset consumption (similar to depreciation) to understand the effective level of investment underpinning growth in output. The sector’s consumption of fixed capital (effectively depreciation), over the same period has been on average $12.6 billion per year. This indicates that over the past decade the level of investment has not been keeping pace with consumption, although there are potentially a number of exogenous reasons for this, such as the prolonged drought constraining owners’ own investment capital.

A scenario-based approach was used to define four different growth trajectories and these were used to estimate the sector’s capital requirements:

1. Get to $100 billion: assumes there are no demand or supply constraints and is calculated as the average annual growth rate required to reach GVP of $100 billion across the sector by 2030.
2. Historical growth rates: based on historical growth trends continuing, assuming there is no lack of demand for Australia’s products.
3. Maintain market share: assumes that market shares and prices are held constant while population growth and changes in consumption per capita drive demand.
4. Current investment path: applies the relationship between the net increase in productive capital stock and GVP to test the outcome of the current investment path.

Figure ES1 presents the estimated growth in GVP by 2030 under each of these scenarios. It indicates that the sector is unlikely to achieve GVP of $100 billion per annum by 2030 without additional capital investment. Furthermore, Australian producers would also need to expand their share of export markets to absorb the additional production. While the high historical growth scenario (dotted line) indicates that the $100 billion target could be reached before 2030, this is a low probability statistical estimate reflecting the variability and uncertainty in the modelling.

The seeds of change

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While the quantum of capital services available to agriculture, fisheries and forestry has grown, the rate of growth is significantly slower than mining and manufacturing. This both constrains the rate of growth in productivity (supply side constraint), but also reflects the perceived relatively poorer performance of investment in capital for the sector (demand side constraint).

Planting the seed

A scenario-based approach was used to define four different growth trajectories and these were used to estimate the sector’s capital requirements:

1. Get to $100 billion: assumes there are no demand or supply constraints and is calculated as the average annual growth rate required to reach GVP of $100 billion across the sector by 2030.
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Each $1 billion of growth in GVP is estimated to require a net increase in the sector’s stock of productive capital of between $1.77 and $5.34 billion\(^1\). For example, to achieve GVP of $100 billion, the net increase in productive capital required is estimated at $8.7 billion per annum (see Table ES1).

To put this into context, average annual net investment in productive capital in the Australian agriculture, fisheries and forestry sector has been approximately $1.2 billion over the past 30 years (ABS, 2019). Therefore, a significant and sustained increase in capital investment will be required to enhance the productive capacity of the sector and achieve annual GVP of $100 billion by 2030.

---

\(^1\)Net capital investment takes asset consumption (similar to depreciation) into consideration to understand the effective level of investment underpinning growth in output.
The results of the modelling indicate that:

- All other things being equal, if historical growth rates of GVP are achieved, this could result in the target being achieved in 14 years (with a range of 9 and 33 years, depending on the assumptions used in the modelling) (see Table ES1). This would also require an increase in annual net investment in productive capital to around $6.1 billion.

- Australia already has established market shares for key export markets, many of which are growing rapidly. All other things being equal, if current export market share is maintained, this could result in the target being achieved in 26 years (with a range of 22 and 31 years). If Australia is to maintain its domestic market share and market share for key export markets, production would need to increase rapidly. This would require estimated annual net investment on productive capital of around $2.9 billion.

Figure ES2 shows the estimated split between the total debt and equity capital required under each scenario over a 10 year period, assuming debt to equity ratios of around 20%, which is consistent with recent historical ratios. A relatively static debt to equity ratio is assumed as this is consistent with investment markets being efficient in determining the appropriate source of investment capital between debt and equity based on the specific characteristics of the investment (e.g. cashflows, variability). While this may change over time, the magnitude of the capital requirements do not change.

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Table ES1
Estimated annual net investment in productive capital required to support the growth of each scenario and time to reach $100 billion target (mid-point estimates)

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<thead>
<tr>
<th>Sector</th>
<th>$billion/year to reach $100 billion in 2030</th>
<th>Years to reach $100 billion GVP</th>
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<tr>
<td>1. Get to $100 billion per annum</td>
<td>$8.7</td>
<td>10</td>
</tr>
<tr>
<td>2. Historical growth rate of GVP</td>
<td>$6.1</td>
<td>14</td>
</tr>
<tr>
<td>3. Maintain market share</td>
<td>$2.9</td>
<td>26</td>
</tr>
<tr>
<td>4. Current level of investment</td>
<td>$1.2</td>
<td>34</td>
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Source: NCEconomics estimates and ABS (2019)

*Net capital investment takes asset consumption (similar to depreciation) into consideration to understand the effective level of investment underpinning growth in output.*
Executive Summary

If debt to equity ratios are to remain similar to the current split over the next 10 years, the required capital is likely to come mostly from equity; however, as most of the current equity is owner’s equity and this is constrained, additional equity will have to be sourced from elsewhere (e.g. private equity funds and or institutional equity).

In addition, as land values increase, access to debt may become easier to obtain (as debt to equity ratios differ). However, debt ceilings will still be constrained on analysis of borrowers’ cashflow.

Figure ES2
Estimated split between debt and equity capital under each growth scenario (10 year total)

Source: NCEconomics estimate
Growing the seeds

There is no single issue that is holding back investment in the sector, rather in consultation with representatives from the investor community, the following findings were made:

- Access to quality, timely information and industry performance benchmarks to a standard required by institutional investors has been cited as a key barrier to investment in the sector.

- To secure capital allocations in institutional investment portfolios, the sector needs to demonstrate an attractive risk adjusted rate of return that is also sufficiently different to other asset classes already in portfolios. That is, there needs to be a material point of difference between agriculture, fisheries and forestry investments and other asset classes to justify the expansion of agriculture, fisheries and forestry assets within a balanced investment portfolio.

- The sector needs to establish an efficient model for investment in farmland at scale. There are opportunities to develop new models for land ownership and governance that can link into large scale capital investments.

- Canadian and European fund structures are well suited to Australian agricultural investments because they operate on a defined benefit scheme that removes pressures (real and perceived) of short-term redemption requirements. Consultation revealed that the regulated portfolio liquidity requirements for institutional investors in Australia was cited as an impediment to investment in agriculture, fisheries and forestry assets.

- Requirements for foreign investors are often poorly understood. Further communication is required to clarify the Foreign Investment Review Board (FIRB) process to international investors and local stakeholders alike, and to create streamlined processes to allow capital to be efficiently deployed.

- Investment structures offering returns from environmental financing, such as carbon trading and biodiversity, are emerging. In addition, there is a clear market for Environmental Social and Governance (ESG) and sustainability investments to complement production of food and fibre. This is creating emerging opportunities for producers to diversify their sources of income and providing investors with a means to diversity investment risk.

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Canadian and European fund structures are well suited to Australian agricultural investments because they operate on a defined benefit scheme that removes pressures (real and perceived) of short-term redemption requirements.
First steps

Given these findings, the following first steps are required to underpin a more cohesive and coordinated strategy and to achieve the desired future investment and growth in the sector:

- **Provision of information / tools for producers.** Address deficiencies in the accessibility and appropriateness of information to enable producers to benchmark current performance, understand market opportunities, and better understand production and market risk. This could be through the development of producer-focused tools and further enhancement of existing tools.

- **Information provision for investors.** Current levels of information about individual business, and the sector as a whole, do not meet the needs of the investment community, particularly equity investors.

- **Develop capacity for more partnerships between investors and operators in the sector.** Asset managers are seeking to build long-term partnerships with farmers and corporate operators in the sector.

- **For land-based investment (real assets), land use change and transition of ownership to achieve greater economies of scale and scope for the sector.** The current scale of many agriculture, fisheries and forestry assets reduces their value to third party (equity) investors. In addition, the current focus on production at the enterprise scale, as opposed to value generation, can constrain investment and value adding. For investments where key assets are based on property and access rights (e.g. wild catch fisheries and forestry), these rights need to be better understood by investors to underpin investment in achieving economies of scale and scope.

- **Identify opportunities and models for new forms of ownership and governance.** Mechanisms to enable greater scale, whilst enabling transfer of equity from one generation to the next, will enhance the investor attractiveness for agriculture, fisheries and forestry assets.

- **Pursue ESG and environmental markets to diversity cashflow and investment risk.** Emergence of new environmental finance products and opportunities for enterprise-scale on-farm natural capital products and other environmental benefits in other sub-sectors (e.g. carbon neutral wild catch fisheries) have the potential to open up new pools of capital for the sector.

- **Address liquidity concerns of institutional investors.** Institutional investors have concerns regarding the liquidity of agriculture, fisheries and forestry assets within regulated portfolio management requirements.

- **Address FIRB complexity perceptions.** FIRB requirements can create a perception of complexity for international investors, driving investor uncertainty, and potentially constraining investor interest in agriculture, fisheries and forestry assets.
This section provides background to the project, the project objective and approach to delivering the project.

1.1 Background to the project

AgriFutures Australia seeks to grow the long-term prosperity of Australian rural industries through a range of mechanisms including:

- Initiatives that attract capable people into careers in agriculture and build the capability of future rural leaders.
- Lead research and analysis to understand and address important issues on the horizon for Australian agriculture.
- Research and development for established industries that do not have their own Research & Development Corporation (RDC).
- Research and development to accelerate the establishment and expansion of new rural industries.

The body of work reflected in this report is aligned with both the second and last dot points and is in response to the 2019 National Farmers’ Federation (NFF) document which outlined a roadmap to grow the current value of Australian agriculture from around $60 billion to $100 billion by 2030.

In late 2017, AgriFutures commissioned ACIL Allen Consulting (ACIL Allen) to estimate the farm-gate value of the agriculture, fisheries and forestry sector in 2030 (ACIL Allen, 2019). The report estimated that, from a starting point of 2016-17, the farm-gate value of agriculture would be $84.3 billion by 2030, $15.7 billion below the NFF target.

1.2 Project objective

The objective of the project is to build on existing research to analyse to quantify the capital required over the next decade to support significant growth in Australia’s agriculture, fisheries and forestry sector. The project seeks to take into consideration current and emerging demand for capital from the sector through to 2030, and also considers the drivers and impediments to greater investment in the sector with a 30 year horizon to 2050 to match the outlook of institutional and ‘long tail’ investors looking at opportunities in the sector.

1.3 Project approach

Drawing on a supply and demand analysis framework, the project has used a phased approach that places emphasis on understanding the broader drivers of market growth, the drivers of change that will influence access to capital and ultimately, the ability of the sector to achieve its growth target. We believe this is fundamental because access to capital will not necessarily guarantee growth, and capital formulation is typically a consequence of market opportunities. Hence, market opportunities and capital requirements are inextricably linked.

Figure 1 contains a summary of our approach to delivering this project. It is based on three sequential phases, each building on the previous:

1. Creating the sectoral baseline for agriculture, fisheries, and forestry.
2. Identifying the capital gap.
3. Moving the sector forward.

Research methods that have been drawn on include:

- Review of literature and publicly available data to underpin the analysis of potential agriculture, fisheries and forestry sector growth.
- Interviews with 19 representative organisations from the agriculture, fisheries and forestry sector.
- Interviews with 18 representative organisations from the investor community.

A full list of parties that were interviewed is contained in Appendix E and F.
Figure 1
High-level overview of project approach
Source: NCEconomics

The objective of the project is to build on existing research to analyse and to quantify the capital required over the next decade to support significant growth in Australia’s agriculture, fisheries and forestry sector.
Chapter summary

• The agriculture, fisheries and forestry sector’s industry gross value added has grown relatively consistently in nominal and real terms for several decades, with an increasing focus on improved productivity and accessing export markets. However, as the Australian economy has matured and modernised, the relative contribution of agriculture, forestry and fisheries has steadily declined.

• In real terms, the contribution of changes in volume, price and value to sector growth has been mixed over the past 20 years. In aggregate, value has grown by around 20%, with price changes accounting for the greater proportion of this growth. This is a reflection of the fact that domestic markets are mature, relatively small, and largely grow at the rate of population growth. Export markets are more dynamic, exhibiting potentially greater opportunities for overall sectoral growth.

• Over the past 20 years, agriculture, fisheries and forestry exports have increased by 34% and now accounts for around two thirds of the total value of production within the sector (ABARES, 2018).

• In the period 1975 – 2011, agriculture exhibited the highest index of volatility, ahead of finance and insurance (Keogh 2015). Volatility is increasing relative to other sectors and has implications for attracting investors to the agriculture, fisheries and forestry sector.

• The approach of holding market shares and prices constant, while using projected population growth to predict demand, indicates that the industry will not reach the $100 billion target by 2030. Therefore, Australia will need to increase its market share or find new markets or establish new products to increase the chances of reaching the target. Capital investment will play an important role in all strategies.
2.1 Approach

To establish the agriculture, fisheries and forestry sector baseline, drivers of change, competitive advantages and constraints to growth were reviewed and analysed. The following approach was taken:

- Review of data and grey literature on the current size and growth trends in the sector, with a distinction between export and domestic markets. This provides an understanding of growth potential.
- Semi-structured interviews with sector representatives to confirm baseline, trends, growth opportunities and investment requirements.
- Identification of the main opportunities for sector growth.

Defining the sector

Australia produces an extensive range of agricultural, fisheries and forestry products, spanning avocados through to yabbies. Some of these products are sold in their raw state (e.g. potatoes) while others are sold following a degree of product manufacture (e.g. sawlogs).

To estimate the growth potential of the sector by 2030, we define the agriculture, fisheries and forestry sector to include a degree of value adding beyond primary production at the farm for some sectors to align with trade data. For example, rather than considering grapes alone, we include the production of wine.

The scope of the analysis is restricted to the existing suite of goods and services produced by the sector. It does not incorporate new and emerging goods and services.

It should be noted that we have drawn on numerous datasets and information sources. In some cases, these refer to, for example, just agriculture, and exclude fisheries and forestry. Where this is the case, the specific industry is identified. In all other cases, the sector is defined as agriculture, fisheries and forestry.

Key terms used to describe the sector and its relationship to the wider economy include:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic product (GDP)</td>
<td>The overall measure of the annual value of economic activity in the economy. The simple way to think of this is the sum of payments of wages, plus profits to business.</td>
</tr>
<tr>
<td>Gross value added (GVA)</td>
<td>The value of agricultural output less the cost of inputs such as cost of labour, materials, etc. Also known as industry gross value added.</td>
</tr>
<tr>
<td>Gross value of production (GVP)</td>
<td>The value of production at the point of sale. It is calculated using price and quantity information about a given product/commodity. For the agriculture, fisheries and forestry sector, the point of sale is where it passes out of the agriculture sector of the economy. Sometimes this is measured at the farm gate.</td>
</tr>
</tbody>
</table>

Further information about our approach to defining the sector is contained in Appendix A.
Defining capital

In seeking to identify the capital required to support the growth of the industry, capital is considered in two key ways in this report:

1. Capital goods: The assets that underpin the production of the sector’s output, including fixed capital (e.g., machinery, buildings) and working capital (stocks of raw materials and part-finished products, as well as money, that are used up quickly in the production process). This definition is used to understand the sector’s stock of capital, which is the foundation of production.

2. Financial capital: Any resource measured in monetary terms used to support the production of goods and services. The two main forms of financial capital are equity or debt instruments. This definition is used to understand the investment that, if made in the sector, could support growth.

2.2 Overview of sector

Agriculture, fisheries and forestry in the wider Australian economy

The agriculture, fisheries and forestry sector represented 2.2% of Australian Gross Domestic Product (GDP) in 2019 (Figure 2).

Whilst one of the lowest economic contributors to the Australian economy, the sector is an important contributor to Australia’s overall prosperity. In addition to food security, the sector is responsible for 11% of goods and service exports (ABARES, 2020a). Based on value, approximately 70% of the sector’s production is exported.

The agriculture industry (excluding timber production and fisheries) occupied 385 million hectares of land in 2016, representing 58% of Australia’s total land use and generated employment for 361,300 people (ABARES, 2020a). While this represents just 2.9% of Australia’s total workforce, most of these workers live in regional areas with the sector creating vital employment opportunities in regional communities (ABS, 2020; Binks et al, 2018).

Over the past 30 years the sector has seen a decline in its share of GDP measured in industry gross value added (IGVA). Since 1990, contribution to GDP has declined from 4.6% to 2.2% (ABS, 2019). Figure 3 shows this decline, which is largely a function of the Australian economy maturing and diversifying into other sectors, such as service sectors.

Agriculture, fisheries and forestry is not alone. Other sectors have also failed to keep pace with high growth industries, for example manufacturing, which has seen the biggest decline in share of GDP (ABS, 2019).

The sector accounts for around 2.2% of GDP, around 11% of Australia’s export revenue and almost 3% of total employment.
Establishing baseline growth in the sector

**Figure 2**
Agriculture, fisheries and forestry share of GDP (2019)
*Source: ABS (2019)*

**Figure 3**
Industry gross value added as a percentage of GDP
*Source: ABS (2019)*
Whilst there has been a relative decline in IGVA as a percentage of GDP, in absolute terms the sector has grown from $18.1 billion in 1975 to $40.7 billion in 2019 (in real terms). Figure 4 illustrates that the IGVA of the sector has improved at a compound annual growth rate of 1.8% over the past 30 years.

Drivers and patterns of growth vary within and between industries in response to different circumstances. For example, between 1999–2019:

- Meat and live animals production has increased by 44% and exports have increased by 34%.
- Fruit and vegetable production has increased by 30% and exports have increased by 69%.
- Grain and oilseed production has decreased by 7% and exports have increased by 3%.
- Forest production has decreased by 4% and exports have decreased by 6% (ABARES, 2020a).

Figure 5 presents 2018–19 the sector’s value of production by product.
In real terms\(^2\), the contribution of changes in volume, price and value has been mixed over this time. Figure 6 illustrates that increases in volume have driven growth in the value of crops (including horticulture), whereas increases in price have driven growth in the value of livestock and livestock products. In aggregate, value has grown by around 20%, with volume changes accounting for the greater proportion of this growth. These differences have a profound impact on investment opportunities, particularly where most crop export opportunities relate to bulk commodities (e.g. wheat, cotton, sugar), and where dampening product prices inhibit investment prospects compared to competing investment opportunities.

\(^2\)Real prices and values that have been adjusted to remove the effects of inflation.
Figure 6
Contributions to increased value of agricultural production, 1999-00 to 2018-19

Source: Based on ABARES (2020a)

Notes: Estimates relate to the agriculture sector only (and do not include fisheries and forestry), crops includes horticulture, values represent the growth in each variable over the past 20 years (not the proportion of growth that can be attributed to each factor), a preliminary estimate for 2017-18, a real prices and values are adjusted to remove the effects of inflation.

Exports
Australia exports about 70% of agricultural output. Meat and live animal exports have grown by 99% in value over the past 20 years to 2018-19. Over the same period, exports of forest products have recorded the second highest growth (54%), albeit from a relatively low base (ABARES, 2020a).

Global demand for agriculture, fisheries and forestry products is increasing as population and per capita incomes increase and demographic changes (e.g. urbanisation) result in major changes to per capital consumption patterns (volume and product mix).

Within Australia’s top eight Asian markets\(^3\), exports have grown by 86%, while exports to all other markets have declined by 22% over the past 20 years to 2018-19 (ABARES, 2020a). Figure 7 presents export value by destination for agriculture, fisheries and forestry since 2000-01.

\(^3\)Top eight markets are: China, Japan, Indonesia, Korea, Rep. of, India, Vietnam, Hong Kong, Singapore
Figure 7
Agriculture, fisheries and forestry fob⁴ exports by destination ($M)

Source: Based on ABARES (2020a)

Reliance on the export market varies across the sector. Over the three years to 2016-17, export sales accounted for around:

- **98%** of wool and cotton production volume
- **76%** of beef
- **71%** of wheat
- **41%** of dairy
- **18%** of horticultural products (ABARES, 2020a).

The bulk of growth in volumes and values of agricultural production in Australia in recent years has been attributable to export markets. Australia’s ability to penetrate and maintain market share in key markets is driven by a complex array of physical production parameters (within Australia and internationally), demographics (populations and population movements), market conditions (e.g. prices and exchange rates), policies (including non-price tariff barriers and other regulations), consumer tastes, and export destination countries’ own agricultural policies and aspirations.

The sector’s high reliance on exports means that it has greater exposure to volatile international production dynamics and subsequent world prices. Volatility in agriculture is driven by both physical parameters (e.g. climate) and economic/market conditions (e.g. exchange rates). This volatility has implications for the attractiveness of the sector for investors.

Keogh (2012) presents analysis based on the index of relative volatility in annual value of output for major Australian economic sectors (see Table 1). In the period 1975 – 2011, agriculture has the highest index of volatility of any of the major economic sectors in Australia, ahead of finance and insurance. In more recent history (2004-2011), the volatility of agriculture has increased.

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⁴FOB (free on board), means that a seller pays for transportation of the goods to the port of shipment, plus loading costs
### Table 1
Index of relative volatility in annual value of output for major Australian economic sectors

<table>
<thead>
<tr>
<th>Industry sector</th>
<th>Whole period 1975-2011</th>
<th>2004-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, fisheries and forestry</td>
<td>234</td>
<td>293</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>157</td>
<td>153</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>103</td>
<td>150</td>
</tr>
<tr>
<td>Mining</td>
<td>128</td>
<td>122</td>
</tr>
<tr>
<td>Construction</td>
<td>134</td>
<td>116</td>
</tr>
<tr>
<td>Administrative services</td>
<td>115</td>
<td>111</td>
</tr>
<tr>
<td>Retail trade</td>
<td>75</td>
<td>107</td>
</tr>
<tr>
<td>Rental and real estate services</td>
<td>73</td>
<td>102</td>
</tr>
<tr>
<td>Transport</td>
<td>72</td>
<td>83</td>
</tr>
<tr>
<td>Professional services</td>
<td>97</td>
<td>83</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>75</td>
<td>76</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>120</td>
<td>65</td>
</tr>
<tr>
<td>IT, media and telecommunications</td>
<td>120</td>
<td>65</td>
</tr>
<tr>
<td>Electricity, gas and waste</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>Public administration</td>
<td>49</td>
<td>45</td>
</tr>
<tr>
<td>Education and training</td>
<td>54</td>
<td>42</td>
</tr>
<tr>
<td>Health care</td>
<td>46</td>
<td>29</td>
</tr>
<tr>
<td>All industry average</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Keogh (2012), based on ABS data.

Over the past 20 years, the value and volume of agriculture, fisheries and forestry exports has increased by 19% (ABARES 2020a). In the period 1975–2011, agriculture exhibited the highest index of volatility, ahead of finance and insurance (Keogh 2015). Volatility is increasing relative to other sectors and has implications for attracting investors to the agriculture, fisheries and forestry sector.
### 2.3 The outlook for growth

The purpose of this section of the project is to build on the ACIL Allen research (2019) by further investigating the potential for the sector to reach its growth target, with a focus on population and consumption in domestic and export markets.

**Approach to establishing the growth outlook**

Evidence-based quantification of the growth potential for the sector is a critical component of understanding the extent to which capital may be mobilised to support the sector’s growth ambitions. Therefore, for the purposes of establishing the growth outlook, we have focused on population and consumption patterns to provide insight into the potential demand for products from the sector.

Figure 8 provides an overview of the approach to estimating the future demand for agriculture, fisheries and forestry products, which is further detailed in Appendix A. Within this approach:

- Population is the total annual forecast population per country (Australia and export destinations) for 2020 to 2030. (Source: FAOSTAT)
- Net annual consumption per product is the sum of domestic production and imports less exports per country for 2020-2030, based on historical trends. (Source: FAOSTAT)
- Australian market share is the ratio of trading partner’s imports from Australia’s to total imports for a given product (Source: FAOSTAT). For example, China is expected to remain one of Australia’s largest trading partners for wine in 2030, as shown in Figure 11. However, for other products, market share may decline as larger exporters (e.g., Brazil) grow at a faster rate, or if tariffs between Australia and China continue to impact trade.
- Forecast change in consumption per capita is the change in consumption patterns related to the process of urbanisation based on historical and projected trends (Source: FAOSTAT).

*Figure 8*

Overview of approach to estimated growth

*Source: NCEconomics*
Appendix A outlines the method for establishing the 10-year forecasts, while Appendix B outlines a detailed example of a forecast for the Australian wine industry.

Figure 9
Illustrative example of forecast future trade by product – Destination of Australia’s wine production value - 2030

Source: NCEconomics

The approach of holding market shares and prices constant, while using projected population growth to predict demand, indicates that the industry will not reach the $100 billion target by 2030. Therefore, Australia will need to increase its market share or find new markets or establish new products to increase the chances of reaching the target. Capital investment will play an important role in all strategies.
Industry outlook

The approach outlined above provided a range of estimates for Australia’s gross value of production (GVP) for each product grouping in 2030. These are presented in Table 2, along with their respective contribution to total value.

The baseline projections indicate that, holding market shares and prices constant, the sector’s GVP is estimated to reach around $78.4 billion by 2030. The estimates range from $74.3 – $82.7 billion\(^5\).

These estimates are less than the $100 billion target for GVP and suggests that either market shares in current markets must be increased, or new markets and products must be established, in order to reach the target. It is also expected that the composition of the industry will remain largely the same, with no sector’s proportion of the total value changing by more than 1% over the 10-year period (based on the most likely estimates).

Given this, and the role that capital can play in increasing sector productivity, price and market share, there is a need for significant investment if the sector is to meet its target.

Table 2
Current and forecast future value of demand for Australia's agriculture, fisheries and forestry products

<table>
<thead>
<tr>
<th>Product</th>
<th>Current (2020)</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$billion</td>
<td>% of total</td>
</tr>
<tr>
<td>Grains</td>
<td>$14.7</td>
<td>21.8%</td>
</tr>
<tr>
<td>Sugar</td>
<td>$1.0</td>
<td>1.5%</td>
</tr>
<tr>
<td>Wine</td>
<td>$0.8</td>
<td>1.1%</td>
</tr>
<tr>
<td>Cotton</td>
<td>$1.0</td>
<td>1.5%</td>
</tr>
<tr>
<td>Horticulture</td>
<td>$11.6</td>
<td>17.3%</td>
</tr>
<tr>
<td>Other crops</td>
<td>$1.8</td>
<td>2.6%</td>
</tr>
<tr>
<td>Livestock</td>
<td>$22.5</td>
<td>33.5%</td>
</tr>
<tr>
<td>Dairy</td>
<td>$4.2</td>
<td>6.3%</td>
</tr>
<tr>
<td>Other livestock products(^6)</td>
<td>$3.5</td>
<td>5.3%</td>
</tr>
<tr>
<td>Fisheries</td>
<td>$3.3</td>
<td>4.9%</td>
</tr>
<tr>
<td>Forestry</td>
<td>$2.9</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$67.3</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: NCEconomics, based on FAOSTAT and ABARES data.

\(^5\) Includes wool, eggs, honey and beeswax products.
\(^6\) Using an earlier starting point of 2016-17, ACIL Allen estimated a similar GVP of $84.3 billion by 2030.
Global demand for agriculture, fisheries and forestry products is increasing as population and per capita incomes increase and demography changes.
Identifying the role of capital in the sector

Chapter summary

• Change in the net capital stock of machinery, equipment, R&D computer software has averaged approximately $1 billion per annum over the past 30 years (derived from ABS, 2019).

• While multiple sources of capital are available to the sector, equity (primarily owners’ equity) dominates due to constraints on debt servicing.

• The debt to equity ratio has increased over time from 9.5% (1990) to around 20% (2019), but is low relative to other sectors (ABS, 2019 and RBA 2019).

• As of 2019, Australia’s agriculture, fisheries and forestry sector had total debt to institutional lenders of $80.2 billion, with banks accounting for 95% of this lending (RBA, 2019). Debt finance is significantly concentrated in commercial lenders (i.e. the traditional banking sector). Uptake of more sophisticated debt instruments (e.g. trade debt and fixed interest products) has been minimal. Debt is not distributed equally among all agriculture, fisheries and forestry sector participants, with large farms holding a disproportionate amount of debt.

• Research and consultation reveals that equity investments are currently relatively modest within the agriculture, fisheries and forestry sector. There are a number of material impediments to greater equity capital, including: liquidity requirements, foreign investment rules, fund manager inexperience, environmental concerns and market volatility.
• Broadly, reported returns for agricultural assets do not create a compelling investment case for the asset class, creating an impediment to attracting capital, particularly where larger transactions are sought for equity capital. There is evidence to suggest a cohort of high-return assets exist in the sector, and this is the cohort of assets and projects attractive to investors. Enterprises with such assets tend to secure returns by making significant investment in intensification, value adding and integration along the supply and value chain. However, there is a degree of opacity around these investments and poor understanding of the risk adjusted rates of return across the sector can constrain the interest of institutional investors making allocations to asset managers exposed to the sector.

• The long-term volatility of returns across agriculture, forestry and fisheries can create an impediment to access to capital and a need for a greater proportion of equity investment to match the risk/return profile over time. Investments with higher volatility of cashflow returns and/or lags between investments and returns will likely require a higher proportion of equity within the capital mix.

Research and consultation reveals that equity investments are currently relatively modest within the agriculture, fisheries and forestry sector.
3.1 Approach

To establish the role of capital in the sector, the following key steps were undertaken:

- Identification of capital stock in the sector.
- Review of the capital stock structure.
- Review of the role of capital in enhancing productivity.
- Identification of the risks and returns associated with the sector.
- Semi-structured interviews with investor sector representatives to confirm understanding of the role of capital within the agriculture, fisheries and forestry sector.

3.2 Capital stock in the agriculture, fisheries and forestry sector

Net capital stock underpinning productivity

The capital stock of the sector has grown over the past 30 years and is estimated at $505 billion in 2019 (ABS, 2019). The growth in net capital stock has been predominantly driven through appreciation of rural land value, rather than through growth from investments that directly underpin growth in output (e.g. investment in machinery and equipment, non-dwelling construction or R&D).

Figure 10 illustrates the growth in net capital stock in the sector and shows the dominance of non-dwelling construction (e.g. water infrastructure), as well as investment in machinery and equipment. Over the past 30 years, the change in net capital stock of plant, equipment, R&D (on-farm and off-farm), and computer software has averaged approximately $1.0 billion per annum.

In 2019, the total net capital stock across all Australian economic sectors was $6,317 billion (ABS, 2019). Net capital stock in the agricultural, fisheries, and forestry sector equates to 2.3% however, the sector’s proportion of Australia’s total has been in decline, in part because of a lack of investment.

Further information regarding the measurement of capital stock is provided in Appendix C.

Change in the net capital stock of machinery, equipment, R&D, and computer software has averaged around $1 billion per annum over the past 30 years (derived from ABS, 2019).

3.2 Capital stock in the agriculture, fisheries and forestry sector

Net capital stock underpinning productivity

The capital stock of the sector has grown over the past 30 years and is estimated at $505 billion in 2019 (ABS, 2019). The growth in net capital stock has been predominantly driven through appreciation of rural land value, rather than through growth from investments that directly underpin growth in output (e.g. investment in machinery and equipment, non-dwelling construction or R&D).

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In 2019, the total net capital stock across all Australian economic sectors was $6,317 billion (ABS, 2019). Net capital stock in the agricultural, fisheries, and forestry sector equates to 2.3% however, the sector’s proportion of Australia’s total has been in decline, in part because of a lack of investment.

Further information regarding the measurement of capital stock is provided in Appendix C.

Change in the net capital stock of machinery, equipment, R&D, and computer software has averaged around $1 billion per annum over the past 30 years (derived from ABS, 2019).

---

1 The stock of plant, equipment, R&D, cultivated biological resources, computer software and non-dwelling construction, excluding the value of land / real estate assets.
Identifying the role of capital in the sector

The growth in net capital stock has been predominantly driven through appreciation of rural land value, rather than through growth from investments that directly.
3.3 Structure of capital in the agriculture, fisheries and forestry sector

Capital investment can take the form of debt or equity and may come from, for example, sovereign funds, superannuation funds, commercial lenders, family offices or individuals. Debt capital including trade finance, and owner equity are common in Australia’s agriculture, fisheries and forestry sector, (KPMG, 2015). While there are foreign investment limitations in Australia, a number of significant equity transactions involving foreign institutional investors have taken place in recent years, and sector specific private equity funds operate in Australia. Appendix F contains further information about other capital investment strategies, including venture capital and impact investment.

Figure 11 presents the total capital stock including land within the sector (as land and other capital items are typically bundled) and relative contribution of debt and equity over time. It suggests that the debt to equity ratio was 9.5% in 1989, reached a peak of 20.6% in 2015, before declining to 18.9% in 2019 (in response to rapidly increasing market values for land) (ABS 2019 and RBA 2019).

The high and growing equity ratio is largely attributed to land value appreciation within the sector which is not necessarily converted to better cashflow and profits. (ABS 2019 and RBA 2019). Appreciating land values do not necessarily translate to improvements in the productivity of capital.

Debt to equity ratios, even at current levels of around 20%, are relatively low compared to other sectors (average of around 70% for non-financial corporations in Australia). This is largely a reflection of the fixed nature of debt servicing and the volatility of revenues and risk appetite in the sector.

Based on the data used to estimate equity capital over time, land value appreciation is the main driver of increases in equity capital in the agriculture, fisheries and forestry sector (ABS 2019 and RBA 2019).

The sector is typified by relatively low levels of financial leverage. The debt to equity ratio has increased over time from 9.5% (1990) to around 20% (2019), but is low relative to other sectors (ABS, 2019 and RBA 2019).

Figure 11
Debt and equity in the agriculture, fisheries and forestry sector capital stock
Source: ABS (2019); RBA (2019)
Debt capital in the sector

Debt is commonly used in capital structures to improve financial leverage, enhancing return on equity. Attitudes towards use of debt vary across the sector, with investor interviews revealing a risk appetite that typically ranged between 20-30% of debt in the capital structure.

The amount of debt capital made available to the sector is a function of lending decisions based on factors such as the ratio of debt to equity (Cotter, Rochecouste & Mohsin, 2016) as well as the level and volatility of a business’ profits which affects serviceability risk (KPMG, 2016). Industries reliant on property rights as a basis for production (e.g. fisheries) can face further complications as lenders may not consider a property right (e.g. a quota) in the same way as land for the purposes of security underpinning debt.

As of 2019, Australia’s agriculture, fisheries and forestry sector had total debt to institutional lenders of $80.2 billion, with banks accounting for 95% of this lending (RBA, 2019) (see Figure 12).

Rural debt, as it is termed by the Reserve Bank of Australia, increased 88% between 2000 to 2019, in real terms (RBA, 2019). Rising rural debt is attributed to multiple factors, including lower interest rates and increased land values (Department of Agriculture, 2019).

Rural debt is not distributed equally among all sector participants, with large farms holding a disproportionate amount of debt. In broadacre farms, 70% of debt is held by 12% of farms, while for dairy farms, 70% of debt is held by 30% of farms (Department of Agriculture, 2019).

There is significant variation across the sector, with some sub-sectors recording low debt to equity ratios, for example, broadacre and dairy farms average 13.6% and 25%, respectively. All else being equal, a low debt level, relative to equity, is expected to improve a farm’s ability to borrow funds to meet cash flow needs (Department of Agriculture, 2019).

Table 3 breaks down agriculture lending by authorised deposit taking institutions (ADI) in Australia as of 2016. In 2016, National Australia Bank (NAB) was Australia’s biggest agricultural lender. Based on consultations, this is still the case.

As of 2019, Australia’s agriculture, fisheries and forestry sector had total debt to institutional lenders of $80.2 billion, with banks accounting for 95% of this lending (RBA, 2019).

Debt finance is significantly concentrated in commercial lenders i.e. the traditional banking sector. Uptake of more sophisticated debt instruments (e.g. trade debt and fixed interest products) has been minimal.

Debt is not distributed equally among all agriculture, fisheries and forestry sector participants, with large farms holding a disproportionate amount of debt.
Trade finance is another form of debt often used by the sector to meet short-term working capital requirements (KPMG, 2016). This type of capital comes from trade counterparties with an example being a loan for farm machinery. The amount of capital available through trade finance is limited.

Equity capital in the sector

Owner equity refers to an investment of capital made by an owner of the business. The accumulation of owner equity is a function of both retained profits and capital gains on assets. The amount of this type of capital available depends on multiple factors, including the profitability of the business (KPMG, 2015).

There is often insufficient internal equity available to take advantage of new opportunities (Cotter, Rochecouste & Mohsin, 2016). Therefore, business owners look to obtain capital from other sources, including:

- **Private Equity.** Private equity is an alternative investment class and consists of capital that is not listed on a public exchange. Private equity is composed of funds and investors that directly invest in private companies or enterprises.

Private equity capital is growing in the agriculture, fisheries and forestry sector. However, this has generally concentrated on larger enterprises and/or to finance investment that involves multiple activities along the supply and value chains. Consultation also revealed investments in water allocations have accounted for a significant proportion of recent private equity investments, for example the Gundaline property transactions.

- **Institutional Equity.** Institutional equity typically pools money to purchase securities, real property, and other investment assets across the sector. There are multiple institutional investors including banks, credit unions, insurance companies, superannuation funds, and mutual funds.

Industry superannuation funds are significant players in the institutional equity market, holding $725 billion worth of assets or 25% of Australia’s total superannuation assets (APRA, 2019). These industry super funds hold over $1.6 billion of investments in the sector representing 0.22% of their portfolio (Industry Super Australia, 2018). Retail superannuation funds in Australia, which hold 21.7% of total superannuation assets in Australia, have little to no investment in agriculture.

### Table 3

<table>
<thead>
<tr>
<th>ADI</th>
<th>$ billion</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAB</td>
<td>$49.4</td>
<td>Agriculture, Fisheries &amp; Forestry</td>
</tr>
<tr>
<td>ANZ</td>
<td>$47.5</td>
<td>Agriculture, Fisheries &amp; Forestry and Mining</td>
</tr>
<tr>
<td>CBA</td>
<td>$18.6</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Westpac</td>
<td>$18.3</td>
<td>Agriculture, Fisheries &amp; Forestry</td>
</tr>
<tr>
<td>Rabobank</td>
<td>$13.8</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Suncorp</td>
<td>$4.1</td>
<td>Agribusiness</td>
</tr>
<tr>
<td>Rural Bank</td>
<td>$3.3</td>
<td>Agriculture</td>
</tr>
</tbody>
</table>

Source: Adapted from Customer Owner banking Association, (2017) *Based on bank
Globally, pension funds have a value of USD $40.2 trillion (Willis Towers Watson, 2019), with some funds allocating only 1% of total funds under management to agriculture investments (Industry Super Australia, 2018), including within Australia’s agricultural, fisheries and forestry sector.

Due to the size of the superannuation/pension funds, there is increasing interest in how such funds could support further investment in the sector. The Australian Parliamentary enquiry on Superannuation Fund Investment in Agriculture (2018) and consultation undertaken for this project identified key constraints to superannuation funds investment include:

- Liquidity requirements: agricultural, fisheries and forestry assets classes are considered less attractive as they are generally difficult to liquidate quickly.
- Foreign investment rule complexity: international capital is constrained in greater participation owing to the complexity of investment rules.
- Fund manager inexperience / understanding of the sector: effective and efficient due diligence on investments is constrained by lack of experience/understanding.
- Environmental concerns: there is a perception among some investors that agricultural assets do not ‘fit’ with emerging corporate social responsibility requirements.
- Volatility of markets: the counter-cyclical nature of returns to agricultural assets reduces the attractiveness of these assets within a balanced investment portfolio. Also, sector performance data is not readily available.

Australian deposit taking institutions regulated by the Australian Prudential Regulatory Authority (APRA) are required to maintain Prudential Standards. APS 210 requires institutional investors to maintain a portfolio of liquid assets sufficient in size and quality to enable the institution to withstand severe liquidity stress which limits how much capital can be placed into sectors like agriculture, fisheries and forestry which are typically long term illiquid investments.

Research and consultation reveal that equity investments are currently relatively modest within the agriculture, fisheries and forestry sector. There are a number of material impediments to greater equity capital, including: liquidity requirements, foreign investment rules, fund manager experience, environmental concerns and market volatility.

The Gundaline irrigation property in NSW made headlines in recent years with a +$70m sale that followed an initial reported $25m acquisition with an application of $15m in capital to scale up the operation. This represents the type of private equity transaction that can build confidence within the agribusiness investment community.
3.4 Risk and returns on capital investment

Returns

One of the key impediments to investment identified in the research and through consultation was the performance of agriculture-based investments as an asset class. Figure 13 shows average rates of return over the last 20 years excluding and including capital gains (primarily for land assets) for a number of farming enterprise types and by the scale of enterprises. This has been benchmarked against the ASX average and the average for the Farmland Index. Reliable sources of data on the rates of return in fisheries or forestry in Australia were identified.

The key points from the data include:

- **Average returns** identified through the ABARES farm financial surveys reveal average annual returns consistently lower than the ASX as a whole for major farm types and farm scales. Furthermore, the data reveals the general consensus that larger commercial enterprises generally perform better. This is consistent with the consultation findings.

- **Capital gains** often dominate returns, particularly for smaller enterprises across all enterprise categories. In effect, there is a disconnect between the ability for smaller enterprises to generate profits (often losses) and the value of the land which is increasing. The greater the disconnect between land values and the ability to generate profit from that land, the less attractive the asset may be to investors unless there are opportunities that significantly differ from current uses (e.g. conversion of grazing to irrigation).

- **The Farmland Index** is based on a smaller sample of (generally) larger farms with a greater likelihood of external capital sources (e.g. private equity vs. family farms). This data shows that very sufficient returns are possible from agricultural assets to attract equity capital. However, consultation revealed the characteristics of these enterprises (and their attractiveness to investors) was atypical of much of the agricultural asset class. Furthermore, the returns were not achieved through a strategy of acquiring the assets and simply continuing operations as they were.

Rather the returns were made possible through significant investments in intensification, value adding and integration along the supply and value chains, efficiency enhancements, and a greater use of professional inputs.

Consultation with equity investors (private and institutional) also revealed that significant information gaps that made the identification of commercially attractive opportunities (the outliers in the published data) difficult and costly. Given the relatively small scale of most agricultural investments, and the fact that due diligence of investments is a relatively fixed cost, the search costs for the high return agricultural investment opportunities are a major impediment to access to capital.

→ Broadly, reported returns for agricultural assets do not create a compelling investment case for the asset class, creating an impediment to attracting capital, particularly where larger transactions are sought for equity capital.

→ There is evidence to suggest a cohort of high-return assets exist in the sector, and this is the cohort of assets and projects attractive to investors. Enterprises with such assets tend to secure returns by making significant investment in intensification, value adding and integration along the supply and value chain.

→ However, there is a degree of opacity around these investments and poor understanding of the risk adjusted rates of return across the sector can constrain the interest of institutional investors making allocations to asset managers exposed to the sector.
Volatility, timing and matching capital source

Investors reasonably expect a risk adjusted rate of return on their commercial investment. Given the underlying security of debt (a contractual obligation that must be repaid) versus equity investments (that don’t have contractual obligations for repayment and is subordinate to debt instruments and therefore inherently more risky), returns on equity should generally be higher. The volatility of short-run (e.g. annual) returns and the time between the actual investment in the project has a material impact on the appropriateness of debt versus equity capital and an optimal mix of capital. Because debt is effectively a fixed cost to any enterprise with regular debt serving requirements, and where the volatility of returns is very high (including negative cashflow), there will be constraints placed by lenders on debt exposure within the mix of capital instruments.

Furthermore, where investments involve significant lags between investments and returns, they are less likely to be attractive to lenders.

Figure 14 shows this general relationship where investments with higher volatility and time lags would likely necessitate a greater proportion of equity in the mix of capital. This has an impact on the cost of capital.

While financial and other instruments are being developed and / or are available to address some shorter-term risk (e.g. crop insurance, financial products to lock in sales prices etc), those instruments come at an immediate costs (a premium or a fee) and do not necessarily reduce the underlying investment risk. This reinforces the need for investors to see agricultural assets within the context of an overall investment portfolio.

Figure 13
Average rates of return over last 20 years (where size is based on gross turnover)
Source: ABARES (20202c)

$\rightarrow$ Investments with higher volatility of cashflow returns and/or lags between investments and returns will likely require a higher proportion of equity within the capital mix.
The long-term volatility of returns across agriculture, forestry and fisheries can create an impediment to access to capital and a need for a greater proportion of equity investment to match the risk/return profile over time for many investors. The nature of the overall returns and volatility of risks better suits equity investors with long-term investment horizons.

Much of the intensification of production requires a higher proportion of equity due to lags in net cashflow from investments.

**Figure 14**

*Volatility and time lags of investment returns and appropriate mix of capital*

*Source: NCEconomics*

**Volatility**

Figure 15 shows long-term volatility versus the rate of return (including capital gains) across a range of investments, including agricultural industries (large farms with annual revenue > $1 million). It illustrates that volatility can be high relative to some alternative investment classes (e.g., inflation linked bonds and international fixed interest). Furthermore, the dominance of capital gains within the returns for agricultural assets masks the cashflow volatility in the data. This perception was confirmed through the consultation process and is considered a key impediment to investment (both debt and equity).

The data also shows volatility for agricultural industries (which includes impacts such as the millennium drought), was actually lower than the S&P/ASX 300 over the period (which was impacted by the tail end of the 1987 stock market crash and the global financial crisis).

Consultation indicated that the inherent returns and volatility is often better suited to the interests of equity capital where capital gains can also be captured over the long term.

**Time lags and capital requirements**

Research and consultation for this report indicated that much of the recent intensification of irrigation across Australia is reflected in a move from annual, low-value crops to perennial horticulture crops (e.g., almonds, macadamias and avocados). Many of these crops face significant up-front investment costs (e.g., establishment of trees, irrigation infrastructure) and several years of operating costs (e.g., water, energy, labor, fertilizers and pesticides) before positive net annual cashflow can be achieved. An example of this is shown Figure 16 (for small macadamia farm in central Queensland).

The consequence of a cashflow pattern such as the one above is that accessing significant debt financing may not be possible in the earlier years of the investment. However, debt is serviceable for mature investments. Furthermore, because of the lack of economies of scale for much of the farm intensification underway, investments are too small to pique the interest of external equity investors (private capital and institutional). Therefore, the pace of investment is constrained by the ability of farmers to invest owners’ equity.

→ Much of the intensification of production requires a higher proportion of equity due to lags in net cashflow from investments.
### Figure 15

**Volatility vs. rate of return (1990–2016)**

*Source: Adapted from Industry Super Australia (2017)*

* Farm industry returns data include both income and capital appreciation; beef, wheat and other crops and all (broadacre) farm industries returns are from large-scale farms with revenue greater than $1 million, obtained from ABARE database. All (broadacre) farm industries include wheat & other crop, mixed livestock, sheep and beef farms and excludes dairy.

### Figure 16

**Cash flow of an illustrative macadamia farm**

*Source: NCE based on Queensland Government (2020)*
Capital gains often dominate returns, particularly for smaller enterprises across all enterprise categories.
3.5 Sector perspectives on capital

Representatives of the associations for the agriculture, fisheries and forestry sector were asked questions about access to and the need for capital. The following provides a summary, with additional detail provided in Appendix E.

Is access to capital a constraint to growth for the sector?

Interviews revealed that access to capital is often a constraint to growth, but the relative importance of the constraint (relative to other constraints) varies significantly between sectors and within some sectors. For example, forestry, grains, horticulture, sugar and wool sector representatives considered other factors to play a bigger role. These factors include: time to see a return on capital (forestry and other horticultural tree crops), cost-effectiveness of loan terms (grains), regulatory burden (sugar), commodity prices (wool and sugar), were cited as bigger challenges to growth.

What part of the supply chain requires capital to support growth?

Stakeholders had mixed responses to this question, which spanned:

- On-farm: e.g. to achieve economies of scale and other efficiencies.
- Transportation/logistics: e.g. access to rail (cotton in northern Australia), grains (grain wagons) and broader cost of transportation (e.g. wool).
- Processing: e.g. cotton, forestry, grains, especially pulses, pork, wool.
- Value-adding: e.g. sugar (co-generation), fisheries, forestry, wool.

What are the barriers to capital investment in the sector?

Stakeholders cited a number of barriers to investment, including:

- Scale of operations required (cotton).
- Social licence (dairy, eggs, wool).
- Security of access and availability of resource (fisheries).
- Supply chain integration (forestry).
- Production risk, e.g. drought and biosecurity (grains, pork, horticulture).
- Regulatory uncertainty / burden (eggs, sugar).
- Payback timeframes (forestry, meat processors).
- Commodity price volatility (pork, wine).

Are some types of capital investment more appropriate than others?

Stakeholders noted a number of factors determine the extent to which capital is available and appropriate. These include: scale of operations, degree to which operations are ‘corporate’ (compared to ‘family farms’), extent to which there is a track record of foreign investment is established within the sector (e.g. dairy, sugar).

Most stakeholders referred to the importance of debt as a capital investment instrument, particularly for smaller-scale operations. Some, (e.g. dairy, sugar, wine) referred to other capital instruments such as equity, share-farming, and venture capital.
Chapter summary

- Econometric analysis of the relationship between net increases in productive capital stock and the value of production for the sector indicates that for every $1 billion net increase in the productive capital stock, the gross value of production increases by around $0.38 billion per annum (estimated range of between $0.19 and $0.56 billion). Hence, it will take several years for the investment to be recovered.

- Based on this relationship, three different growth scenarios were estimated. These were achieving GVP of $100 billion, continuation of historical growth trends, and maintenance of market shares of current markets.

- Based on the three scenarios considered, GVP of $100 billion is unlikely to be reached by 2030 without additional capital investment. Furthermore, Australian producers would also need to expand their share of export markets to absorb the additional production.

- Estimated annual capital requirements for all growth scenarios are considerably more than current investment levels. To achieve GVP of $100 billion by 2030, the net increase in productive capital required is estimated at $8.7 billion per annum for each year up to 2030.

- Over the past 30 years, average annual net investment in productive capital in the Australian agriculture, fisheries and forestry sector has been approximately $1.2 billion (ABS, 2019). Hence, historical investment levels are far short of those required to meet a notional target of $100 billion GVP by 2030.

- If debt to equity ratios are to remain similar to the current split over the next 10 years, the required capital is likely to come mostly from equity. Most equity investments currently represent owner’s equity and this is constrained. Therefore, to meet future growth requirements, significant increases in equity may have to be sourced from elsewhere.
Defining productive capital stock:

Productive capital stock estimates are derived by writing down each asset in accordance with its decline in efficiency due to age. Annual productive capital stock values were sourced from the ABS System of National Accounts database and includes the value of land (ABS, 2019b). The key components of productive capital stock are:

- Cultivated biological resources.
- Intellectual property and research and development.
- Inventories.
- Machinery and equipment.
- Non-dwelling construction.
- Ownership transfer costs.

It should be noted that, like the net capital stock measure outlined in Section 3, these values of the productive stock of capital are also derived from gross capital stock measures. However, this data and analysis uses the concept of multifactor productivity to isolate relationships between productive capital investments and output. This allows our analysis to better elicit the quantum and type of capital investment required.
Econometric analysis of the relationship between net increases in productive capital stock and the value of production for the sector indicates that for every $1 billion net increase in the productive capital stock, the gross value of production increases by around $0.38 billion per annum (estimated range of between $0.19 and $0.56 billion). Hence, it will take several years for the investment to be recovered.

Variables and assumptions

Table 4 contains a summary of the variables, inputs and assumptions used to underpin the different elements of the model used to estimate the capital requirement.

Table 4

Variables, inputs and assumptions used to estimate capital requirements

<table>
<thead>
<tr>
<th>Modelled element</th>
<th>Variables, inputs, assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth scenarios</td>
<td>Growth rates were established from historical gross value of production data from ABARES and initial baseline modelling (see Section 2.3). These were triangulated using interviews with industry representatives. Four growth rate scenarios were developed based on insights from interviews with industry representatives.</td>
</tr>
<tr>
<td>Capital requirements</td>
<td>Capital requirements were estimated using statistical analysis of key drivers of sector growth (see Appendix C for further detail). This included consideration of ABS data on net productive capital stocks.</td>
</tr>
<tr>
<td>Capital formation</td>
<td>ABS data on rural land value and RBA data on rural debt were used to estimate relative contribution of debt and equity underpinning the capital requirements.</td>
</tr>
</tbody>
</table>
4.2 Growth scenarios

For the estimation of capital requirements, four growth scenarios for annual farm gate GVP were considered. The logic and assumptions for each of the scenarios are outlined below.

Scenario 1 - Get to $100 billion

This illustrative scenario assumes there are no demand or supply constraints and is calculated as the average annual growth rate required to reach GVP of $100 billion per annum (primarily at the farm gate, but including a degree of product transformation) across the sector by 2030. This is intended to be a benchmark of capital required to support the desired level of growth, rather than an estimate of future GVP.

Scenario 2 - Historical growth rate

This scenario is based on historical growth trends continuing, assuming there is no lack of demand for Australia’s products. The historical growth considered is that of the most recent 10 years with the average considered to be a feasible growth path. High and low estimates were also included based on a 95% confidence interval of the historical data. This is intended to represent the growth that could be possible with sufficient demand.

Scenario 3 - Maintain market share

This scenario was calculated as per the baseline method outlined in Section 2.3. It assumes that market shares and prices are held constant while population growth and changes in consumption per capita drive demand. This is intended to represent what may be possible from the demand side without breaking into new markets or achieving greater penetration of current markets.

Scenario 4 – Current level of investment

This scenario applies the relationship between net increase in capital stock and gross value of production to test the outcome of the current investment path. This relationship is discussed further in Section 4.3.

Findings

Figure 17 presents the estimated growth in GVP under each scenario by 2030. It includes low, most likely and high estimates where applicable. Key observations include:

- Only the high (and optimistic) historical growth scenario is expected to reach the $100 billion target by 2030. The likelihood of these being achieved are low without a radical increase in investment and productivity.
- The historical growth scenario has a wide range due to the volatility in historical growth rates.
- The maintain market share scenario indicates relatively low growth, with even the high projection indicating considerably lower growth than what would be required to meet the $100 billion target.
- The maintain market share high scenario has lower expected growth than even the most likely historical growth scenario.
- Current investment levels are unlikely to result in substantial expansion of the sector.

This modelling suggests that growth is unlikely to result in GVP of $100 billion per annum by 2030 without additional capital investment. Furthermore, to continue growing in line with recent (10 year) trends, the sector will need to significantly increase market share and/or establish markets for new products.

Based on the four scenarios considered, GVP of $100 billion per annum is unlikely to be reached by 2030 unless net investment in productive capital is significantly higher than recent trends occurs. Furthermore, Australian producers would also need to expand their share of export markets to absorb the additional production.
If Australia is to maintain its domestic market share and market share for key export markets, production would need to increase rapidly.
4.3 Capital requirements

Outcomes from the econometric model

As outlined in Section 3.4, increased capital stocks support productivity gains. A net increase in the sector’s productive capital stock of $1 billion is estimated to lead to an increase of $0.38 billion in total annual GVP. Using this relationship, the capital requirement for a given level of growth in GVP has been estimated. For each $1 billion of growth in the sector, there is a capital requirement of $2.66 billion\(^1\). For reference, over the past 30 years average annual growth in productive capital stock in the Australian agriculture, fisheries and forestry sector was approximately $1.2 billion (ABS, 2019).

Applying this relationship to the GVP growth under each scenario provides an indication of the relative magnitude of capital required, relative to the current level of investment.

Table 5 contains the estimated annual capital requirements under each scenario, including low, mid (or most likely) and high estimates\(^1\) in addition to an indication of the timeframe that each scenario may take to reach the $100 billion target.

The results of the modelling show:

- To get to the $100 billion target for annual GVP by 2030 (i.e. in 10 years), the annual net investment required is estimated to be $8.7 billion per annum\(^2\), considerably more than historic levels of net productive capital investment (on average, approximately $1.2 billion per annum) (ABS, 2019).
- All other things being equal, if historical growth rates of GVP are achieved, this could result in the target being achieved between nine and 33 years (depending on the range of assumptions used in the modelling). This would also require an increase in annual net investment in productive capital to around $6.1 billion\(^3\).
- Australia already has established market shares for key export markets, many of which are growing rapidly. All other things being equal, if current export market share is maintained, this could result in the target being achieved between 22 and 31 years. If Australia is to maintain its domestic market share and market share for key export markets, production would need to increase rapidly. This would require estimated annual net investment on productive capital of around $2.9 billion\(^4\).

Table 5

<table>
<thead>
<tr>
<th>Sector</th>
<th>$\text{billion/year to reach$100 billion in 2030}$</th>
<th>Years to reach $100 billion GVP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get to $100 billion per annum</td>
<td>$8.7</td>
<td>10</td>
</tr>
<tr>
<td>2. Historical growth rate of GVP</td>
<td>$6.1</td>
<td>14</td>
</tr>
<tr>
<td>3. Maintain market share</td>
<td>$2.9</td>
<td>26</td>
</tr>
<tr>
<td>4. Current level of investment</td>
<td>$1.2</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: NCEconomics estimates and ABS (2019)

\(^1\)With a range of between $1.77 - $5.34 billion per annum, based on a 95% confidence interval. \(^1\)The ranges included in the analysis reflect uncertainty in both the future growth scenarios and uncertainty in the relationship between capital investment and production.

\(^2\)With a range of between $6.5 - $13.2 billion per annum, based on a 95% confidence interval. \(^3\)With a range of between $2.3 - $12.0 billion per annum, based on a 95% confidence interval. \(^4\)With a range of between $2.1 - $4.6 billion per annum, based on a 95% confidence interval.
Each $1 billion of growth in GVP is estimated to require a net increase in the sector’s stock of productive capital of $2.66 billion. Estimated annual capital requirements for all growth scenarios are considerably more than current investment levels. To achieve GVP of $100 billion, the net increase in productive capital required is estimated at $8.7 billion per annum.

4.4 Capital formation

The capital requirements for each scenario were broken down into their components, debt and equity. This was done using historical data on net capital stock for the industry from ABS. Debt to equity ratios were calculated for the most recent 10-year period (2010-2019) and the average (19.8%) was taken as a most likely estimate, while a 95% confidence interval was used as the low (19.5%) and high (20.2%) inputs for the Monte Carlo simulations. This narrow range is a result of low volatility in the ratios across years, which is consistent with capital markets operating efficiently. While debt to equity ratios may change over the longer term and will differ across individual investment opportunities, debt levels will always be capped by the ability of investments to generate cashflows to service all costs (including debt).

Capital split

Figure 18 presents the estimated split between capital and equity that will be required to support growth under each scenario. Key observations include:

- The additional debt capital required over the next 10 years to reach $100 billion is in the order of $17 billion, while the additional equity capital required is in the order of $70 billion.
- Even the scenario with the lowest net capital requirements (maintain market share) would require an additional $5.8 billion and $23.5 billion in debt and equity, respectively.
- Maintaining historical growth rates in GVP would result in GVP of around $78 billion by 2030 and require net capital investment of between $22 and $120 billion over the next 10 years.
As discussed in 3.2, equity capital is currently dominated by owner’s equity. Owner’s equity may not have the capacity to grow quickly as it is a function of retained profits and capital gains. Therefore, the magnitude of the estimated capital requirements indicates that equity may have to come from a different source (i.e. private or institutional equity). Increases in debt capital are also constrained, as farmers tend to borrow against the value of their land and are also restricted by the volatility of their profits. Similarly, enterprises that are property rights based, such as wildcatch fisheries, also face similar constraints attributable to the generation of cashflow and the capital value of property rights (e.g. Statutory Fishing Rights (SFRs)). This suggests that growth in debt requirements (beyond the growth in land values) may be challenging to achieve.

Monte Carlo simulations are a statistical technique used to model the probability of different outcomes in a process that cannot easily be predicted due to the variability in multiple input variables used in the analysis. It is a technique used to understand the impact of risk and uncertainty in prediction and forecasting models. Irrespective of the equity source, access will remain challenging if the investment is not attractive, i.e. where higher returns could be obtained in other sectors.

If debt to equity ratios are to remain similar to the current split over the next 10 years, the required capital is likely to come mostly from equity. However, as most of the current equity is owner’s equity and this is constrained, significant additional equity will need to be sourced from elsewhere to achieve desired growth targets.
Chapter summary

• Access to quality and timely information and industry performance benchmarks is vital to informing investment decisions. The quality, sub-sectoral granularity and timeliness of information, has been cited as a key barrier to investment in the Australian agriculture, fisheries and forestry sector. Given the importance and barrier to investment that it currently presents, further work should be prioritised to understand how to improve this area for investors.

• To secure capital allocations in institutional investment portfolios the agriculture, fisheries and forestry sector needs to demonstrate an attractive risk adjusted rate of return that is also sufficiently different to other asset classes already in portfolios. Further work will be required in the sector to promote greater understanding of the opportunities and enable intermediaries to create investment products suitable for managing sector risks.

• Australia needs to establish an efficient model for investment in farmland and other agricultural, fisheries and forestry assets at scale. There are opportunities to develop new models for land ownership and governance that can link into large scale capital investments. Further work will be required to explore potential models for investment at scale.

• Canadian and European fund structures are well suited to Australian agricultural investments because they operate on a defined benefit scheme that removes pressures (real and perceived) of short-term redemption requirements. Further work will be required to identify potential pools of global capital that could be aligned with opportunities in the sector. A proactive stance will be required in marketing and competing for global capital.
Some global funds operating in Australia cite the FIRB as the single most significant issue blocking capital investment in Australia. However not all agree it is an issue. Whether or not the claims are substantiated, further work will be required to clarify the FIRB process to international investors and locals alike, and to create streamlined means to allow capital in the $50-100 million range to be efficiently deployed into appropriate investments in the agriculture, fisheries and forestry sector.

Investment structures offering returns from environmental financing such as carbon trading and biodiversity are emerging. They provide opportunities for producers to diversity revenue streams and investors to diversify investment risk. There is a clear market for Environmental Social and Governance (ESG) and sustainability investments to complement production of food and fibre. Efforts are underway to establish metrics and governance arrangements to underpin environmental markets and inform sustainability investments. If the Australian agriculture, fisheries and forestry sector can develop a strong proposition around sustainability it could open up a wider pool of available global investment capital. These opportunities will emerge over the medium to longer-term.
### 5.1 Approach

This section draws on consultation with the investment community to identify and scope issues, opportunities and impediments to attracting capital investment to the sector. Findings from the interviews are summarised in Appendix F.

### 5.2 Overview of the investment opportunity

Agriculture, fisheries and forestry investments are often considered as ‘agricultural’ investments within the alternative asset portfolios of institutional investors. The most common investment strategy in agriculture is through real assets with returns derived from the capital gains of underlying real estate coupled with annual income from production operations. Private equity strategies seek undervalued assets or underperforming operations, where opportunities exist to improve profits and/or realise capital gains. Venture capital strategies vary, but are often upstream and focused on inputs or on-farm productivity technology.

For many in the sector, investment is predicated on rapidly growing global population and increasing demand for food and associated agricultural land. Rising average incomes and changes in consumer tastes in developing countries are also expected to increase demand for food and fibre. Coarse grains and other cereals, oil seeds and sugar can also be utilised to produce bio-fuels. Rising energy prices and the need to reduce greenhouse emissions are creating additional demand for these commodities. The net demands on agricultural land will increase its value over time, providing productivity and profitability can be maintained.

All of the above presents a strong thematic opportunity for investing in agriculture, fisheries and forestry. Australia is seen as a politically stable investment destination and many global investors see value in the Australian sector. In some cases, this is a function of the value of irrigation water. Other investors see Australia playing a complementary cyclical role to northern hemisphere production in a globally diversified portfolio.

While there is a generally positive outlook for investors, there are several issues that should be noted and addressed to create a more favourable investment climate. These are outlined below.

> There are a multiple drivers of demand growth and sufficient opportunities for commercial gains to suggest investment opportunities will continue to expand in the agriculture, fisheries and forestry sector. These opportunities can be expanded and realised through a series of initiatives to improve the investment landscape.

### 5.3 Providing investors with quality and timely information

Robust investment decisions are underpinned by quality, relevant and timely information. Obtaining this information has a cost (in terms of time and money, i.e. transaction costs), which investors must pay.

Access to quality, granular and timely, information and industry performance benchmarks has been cited as a key barrier to investment in the sector. While ABARES data has improved over the past decade, it is not compiled using an institutional quality methodology, sample sizes are limited and it often relies on farming and other sector operations to accurately self-report. Furthermore, existing limitation on resources for key agencies such as ABARES also limit the scale, scope, frequency and robustness of data. Investors have identified that the performance of public agricultural equities or exchange traded funds (typically very large commercially-run entities) in Australia are also not representative of the whole sector and do not provide investors with an appropriate picture of sector-wide performance or benchmarks.

Data published by Neil Clarke and Associates identifies that a small percentage of farmers in Australia account for over 80% of the profits and own the majority of the assets. These farmers are private and do not publish accounts. With farmers competing against each other in local markets it is not surprising that few share details on cost of production. This aside, knowledge of, and methods for, calculating unit costs of production vary significantly across the sector and benchmarking efforts. This is an issue as investors are unable to reconcile the complex array of sector risks against historical returns to make investment decisions or raise new capital into the sector.
Attempts have been made to develop an index for the asset class. For example, the Australian Farm Index is an institutional grade performance index split across assets and income. The index methodology is recognised as institutional quality and, while led by a consortium of Australian fund managers, is operated by National Council of Real Estate Investment Fiduciaries (NCRIEF) in the United States. It represents farmland performance for annual cropping and livestock, as well as permanent crops.

The index began in 2015 representing $540 million of assets under management (AUM) over six farm managers and today sits at $760 million AUM across 37 properties with six managers. The index shows an average return of 14%, split between 7% income and 7% capital appreciation, which is significantly higher returns than are represented in the ABARES data, however the composition is sub-scale compared to other assets classes of interest to the investment community. A key challenge is that additional inclusions of large funds would overweight the index. Moreover, the composition will need to be expanded to represent over $2 billion in AUM before the data can be broken down into regional areas.

In short, much of the published information on the financial performance of the sector falls short of the coverage and standard required for the due diligence of the investment community. This forms a barrier to investment.

Given the importance and gaps in institutional quality information and the barrier to investment that it currently presents, further work should be prioritised to understand how to improve this area for investors. This could examine a means to support scaling up the Australian Farmland Index, institutionalise the ABARES data, or get access to the data that sits with the key agricultural lenders in Australia to get a sense of what the top quartile of firms produce and earn.

5.4 Recognising the complexities of risk within a balanced portfolio

Investors in the sector view agriculture as a non-correlated diversifier to overall portfolio risk, an effective hedge to inflation, and an undervalued defensive sector that has substantial upside. In other words, the sector provides a useful means to diversify risk within a balanced investment portfolio. However, the sector needs to demonstrate an attractive risk adjusted rate of return that is also sufficiently different to other asset classes already in the investment portfolio. The timeframe of the investment, volatility and liquidity are important characteristics, among others, that would need to fit with the objectives of any investment portfolio.

Agricultural risk is challenging for many investors. Climate change and weather risk varies across geographies, soil, biosecurity, workplace health and safety, liquidity, products, trade policy, valuation, and operational are a few commonly cited risks which need to be priced into investment propositions.

The scope of risks associated with agriculture, fisheries and forestry assets can be significantly greater than competing asset classes. This additional complexity can create barriers when considering agriculture, fisheries and forestry assets within a balanced investment portfolio.

Investment managers continuously monitor the risk profile and characteristics of an investment against alternative options. For agriculture to present as attractive and complementary to an established investment portfolio, at an appropriate scale to be meaningful, the sector will need to offer investment opportunities with some degree of diversification or risk mitigation across geographical, product price, trade policy, and operational risk exposure. The investment characteristics and risk adjusted rates of return need to sit alongside other asset classes in a portfolio.
The scope of these risk parameters is significantly broader and more complex than many asset classes and this increases the cost of due diligence and monitoring commodities and markets. As an example, in contrast to agriculture, infrastructure is a real asset that can absorb large scale capital allocations with comparable fundamentals of capital gain and annual income, and without many of the risk parameters seen in agriculture. Moreover, the counterpart in an infrastructure transaction is another institution, while the counterpart in an agriculture transaction might be a family that is likely inexperienced in the transaction process.

Competition for investment capital is strong, both across market opportunities as well as between asset classes at the portfolio level. Further work will be required in the sector to promote greater understanding of the opportunities and enable intermediaries to create investment products suitable for managing sector risks.

5.5 Achieving scale to attract investment

From an institutional or private equity point of view, most agriculture, fisheries and forestry assets are relatively small scale. To become competitive with other global markets Australia needs to establish an efficient model for investment in farmland and other assets (e.g. access rights) at scale. At the scale of institutional investment portfolios today, allocations to agriculture need to be in the billions of dollars to give the investment a meaningful weighting within the portfolio and to achieve diversification benefits. Portfolio managers need confidence that capital allocations to the agriculture sector can be responsibly deployed into investments within a set timeframe. At the scale required by large institutional investors, intermediaries need to be able to run efficient transactions where agriculture, fisheries and forestry investments can be aggregated at low transaction costs to achieve sufficient scale to pique the interest of the investment community.

Asset managers are challenged by the practical aspects of linking large scale capital with on-the-ground investment opportunities that can fit the target characteristics of an investment mandate. For example, one US fund operating in Australia completed 47 separate land acquisitions over a period of time to achieve the scale of investment they were seeking – noting international investors are subject to the administrative processes of foreign investment review for each transaction.

With a significant proportion of Australia’s farming population over the age of 65, Australia is entering a period where over half the country’s farming land and other assets is expected to change ownership in the coming years. There are opportunities at this point in history to develop new models for land ownership and governance that can link into large scale capital investments. Further work will be required to explore potential models for investment at scale.

There is often a mismatch between the scale of agriculture, fisheries and forestry investments available and the scale sought by the investment community. Therefore, aggregation of multiple smaller-scale investments is required.

5.6 Managing liquidity risk

Liquidity and divisibility of the underlying asset is an important consideration. The ability of asset managers to sell-off parts of the portfolio is linked to the valuation approach and divisibility of the underlying real assets (e.g. land). Funds with investments in water entitlements are able to quickly value the water rights against a market price and the asset is easily divisible through water markets. This enables portfolios to scale up and down at a relatively low cost of entry and exit. However, dividing up and selling land parcels attracts higher exit costs and requires longer time frames, impacting liquidity. It can take 2-3 years to sell an agricultural asset even with strong annual yields that can help build market interest.

Accumulation schemes used for Australian superannuation allow employees to easily and quickly change fund managers which places a liquidity obligation on funds that affects which asset classes receive allocations. The three-day period for changing between funds means that institutions require a portion of investments in liquid assets. Large funds are regulated to the extent they are have 70% in high liquidity assets. Given the 2-3 year timeframe required to exit an agricultural investment, any allocation to the agriculture asset class would be limited to what is available in 30% of the illiquid proportion of the fund, noting the constraints of portfolio diversification requirements.
This problem has been overcome for other illiquid assets (e.g. infrastructure) through more appropriate property rights that effectively enable divisibility of ownership.

In contrast, Canadian and European fund structures are better suited to agricultural investments because they operate on a defined benefit scheme that locks in capital for a set period, removing pressures of redemptions for periods of more than 20 years. Australian sovereign wealth funds have the flexibility to invest over longer time horizons, however, are reportedly overweight to illiquid assets which are generating higher returns due to their illiquidity.

With regulatory limitations on Australia’s superannuation funds and other market factors that may limit the interest of domestic investors in the Australian agriculture asset class, further work will be required to identify potential pools of global capital that could be aligned with opportunities in the sector. A proactive stance will be required in marketing and competing for global capital.

Foreign institutional investors favour Australia for political investment security and Australia is still deemed to be open for foreign investment, however the timeframe for FIRB reviews of investments has dampened the appetite to some degree.

Not all investors believe that the FIRB process is a red tape block, however there is a perception issue with the process. Several investors noted that FIRB creates less clarity in the transaction process and hinders liquidity. They note that in reality, FIRB does not increase complexity once all parties understand the process. However not all agree, with some global funds operating in Australia citing it as their single most significant issue blocking capital placement. These investors have expressed that going to market to advertise in accordance with the FIRB process is difficult. For large investments the advertising process announces to the region that an institutional buyer is acquiring properties, which immediately inflates land values and undermines the economics of the investment. It also can cause stress to families selling land, often multigenerational farming families not wishing to promote the sale. Neighbouring landowners may be elderly and explaining the FIRB process can be challenging and confronting to some. Furthermore, there is often hostility to foreign ownership.

Whether or not the claims are substantiated, further work will be required to clarify the FIRB process to international investors and locals alike, and to create streamlined means to allow capital to be efficiently deployed into appropriate investments in the agriculture, fisheries and forestry sector.

Relatedly, a Stamp Duty surcharge of an additional 7-8% is applied to foreign investors (PWC, 2020), which can make investment in the sector unattractive relative to other opportunities.

The illiquid nature of many agriculture, fisheries and forestry assets and the timeframes to divest ownership can form an impediment to institutional investment.

5.7 Creating an attractive global capital destination

With Australia’s potential for large-scale real asset backed agricultural investment opportunities and a stable economic and political environment it is not surprising that foreign investors are seeking to place capital into our assets.

The Kingdom of Saudi Arabia, China and Canada have been historical investors in Australian agricultural assets. To be specific, the investments are through the sovereign wealth funds of these countries.

There is some evidence to suggest the FIRB approval process can create both an impediment to investment and can result in unintended consequences.
Creating opportunities for sustainability investment

Environmental, Social and Governance (ESG) investments are becoming increasingly important on the back of market demand. Investments offering returns from environmental financing such as carbon trading and biodiversity are also emerging. However, for asset managers seeking to raise an agricultural impact fund the fundamental mechanics of returns remain centred on primary production. While it is possible to increase carbon sequestration through, for example the regeneration of trees and soil, funds can struggle to make the economics work for large-scale investments, particularly given the short-term trade-offs with cashflow generation from traditional production approaches. Hence, the investment timeframes and lags until cashflow returns become very important.

A survey across 150 investors representing $20 trillion AUM identified that 80-90% of the investment community believe that the sector is moving away from simplistic ESG compliance towards a greater focus on sustainability and recognising the value of non-financial outcomes that deliver more tangible outcomes. However, the survey showed that only half or less of these investors are confident on how to move forward with portfolio allocations in the sector.

While Asian investors are typically compliance focused, European investors are particularly proactive in driving investments from ESG compliance to sustainability outcomes.

Our interviews identified that institutional investors are looking for asset managers to provide solutions for achieving sustainability outcomes and that environmental benefits are increasingly sought. Several of the largest institutional investors contributing to this report believed that sustainability metrics could be ‘right sized’ to make financial returns more attractive and there is also a strong investor demand for better reporting transparency. Replanting trees on a property is not a line item in the balance sheet, however measuring the real returns of improved soil health is an approach that investors can use in modelling future cashflows.

The core investor base is starting to bring sustainability managers into the investment strategy team and today investors are much more focused on sustainability strategy from a terminal value risk management perspective. This is shaping investment themes and is a trend that is expected to continue. If the Australian agriculture, fisheries and forestry sector can develop a strong proposition around sustainability, it could open up a wider pool of available global investment capital. This will require greater levels of consistency in measurement of sustainable outcomes and education from investors through to end-consumers.

There is increasing demand for investment in assets that met ESG or sustainability objectives. This is an area where agriculture, fisheries and forestry could have a specific advantage over many other asset classes. However, metrics to measure outcomes are not well developed across much of the sector, creating a potential impediment to investment.
Throughout this report we have:

- Identified and analysed historic growth patterns for the agriculture, fisheries and forestry sector.
- Identified drivers of future growth, particularly for exports.
- Established a series of potential growth scenarios and the capital investment requirements to fuel that growth.
- Established an understanding of the needs of investors.

The bottom line is that the recent trend in growth of output, or maintaining current shares of major export markets, is not sufficient to achieve an annual gross value of production of $100 billion at the farm gate by 2030. Furthermore, available data shows the bulk of investment in the sector is channelled into land purchases (effectively a transfer of wealth) or are funding asset replacement (simply maintaining productivity). To enhance Australia’s position in global agricultural, fisheries and forestry markets, investment needs to be made in building capacity in rural enterprises that substantively increase productivity.

Without a significant increase in commercially viable investment in productivity improvements, intensification and/or value adding, whilst maintaining a focus on export growth, the current target will not be achieved.

There is no single issue that is holding back investment, rather it is a number of interrelated issues. The Australian agriculture, fisheries and forestry sector operates in a highly competitive, complex and dynamic market environment. The capital investments required to fuel the growth in productivity and value adding must be competitive within the broader investment market to attract capital that will otherwise go into other asset classes. Therefore, to achieve future investment and growth, a cohesive and coordinated strategy is required.

Table 6 provides an overview of the recommended initial actions, timeframes and potential lead stakeholders required to underpin a more cohesive and coordinated strategy.

To enhance Australia’s position in global agricultural, fisheries and forestry markets, investment needs to be made in building capacity in rural enterprises that substantively increase productivity.
<table>
<thead>
<tr>
<th>Issue / impediment</th>
<th>Initiative / action</th>
<th>Timeframe for completion</th>
<th>Potential lead(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information for producers.</strong> Current deficiencies in information to enable producers to benchmark current performance, understand market opportunities, better understand production and market risk. This data needs to be current and presented at a relatively high frequency to meet the needs of users.</td>
<td>• In conjunction with potential end users of information, conduct a review of the quantity, quality, timeliness and presentation of data and information necessary to inform investments at the enterprise scale. &lt;br&gt; • Establish the means to get market information more rapidly to producers, including international market developments. &lt;br&gt; • Work with producers to establish more timely product data (e.g. crop) establishment to enable a greater understanding of demand and supply dynamics. &lt;br&gt; • Consolidate and further targeted research to better understand the long-term impacts of external drivers of productivity and competitive advantage (e.g. relative vulnerability and opportunities attributable to climate change).</td>
<td>Next 2 – 3 years</td>
<td>ABARES, industry bodies, R&amp;D organisations</td>
</tr>
<tr>
<td><strong>Information for investors.</strong> Current levels of information do not meet the needs of the investment community, particularly equity investors. Information to enable producers to benchmark current performance, understand market opportunities, better understand production and market risk. This data needs to be current and presented at a relatively high frequency to meet the needs of users.</td>
<td>• Review existing industry benchmarking and methodologies used to capture and present agricultural, fisheries and forestry business performance data to a quality and timely standard expected by institutional investors. &lt;br&gt; • Review the information needs to underpin efficient due diligence by investors. Where deficiencies are identified, undertake appropriate actions to ensure investor needs are met. &lt;br&gt; • Engage widely to develop an understanding of current gaps in practice which may inhibit a consistent, reliable and independent assessment of cost of production across the sector. &lt;br&gt; • Targeted research to better understand the long-term impacts of external drivers of productivity and competitive advantage (e.g. relative vulnerability and opportunities attributable to climate change including key international competitors). &lt;br&gt; • Conduct a feasibility study to determine the most appropriate means (tool, information clearing house etc.) to overcome information asymmetries between investment opportunities and investors. This would also include opportunities for aggregation of investments.</td>
<td>Next 2 – 3 years</td>
<td>ABARES, industry bodies, R&amp;D organisations, advisory firms</td>
</tr>
<tr>
<td>Issue / impediment</td>
<td>Initiative / action</td>
<td>Timeframe for completion</td>
<td>Potential lead(s)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Develop capacity for more partnerships between investors and operators in the sector. Asset managers are seeking to build long term partnerships with farmers and corporate operators in the sector.</td>
<td>• Undertake a review of the current suite of capacity building programs and research to identify gaps and opportunities in current initiatives, tools and programs to better equip producers and other entities along the supply/value chain with the capabilities to develop long term productive partnerships with asset managers and other investors to meet a modern market environment (including value adding to raw production).</td>
<td>Ongoing</td>
<td>Industry bodies, R&amp;D organisations</td>
</tr>
</tbody>
</table>
| Enable land use change and transition of ownership to achieve greater economies of scale and scope for the sector. The current scale of many agriculture, fisheries and forestry assets excludes their worth to third party (equity) investors. The current focus on production, as opposed to value generation, at the enterprise scale can constrain investment and value adding. | • Through additional targeted research, enhance existing understanding of the relationships between enterprise scale, productivity, profitability, and the ability to attract capital investments (debt or equity).  
• Further investigate options to aggregate and package smaller-scale investment opportunities across multiple enterprises into packages of projects at a scale sufficient to meet the requirements of the investment community.  
• Undertake a review of the current suite of capacity building and research to ensure current initiatives, tools and programs equip producers and other entities along the supply/value chain with the business acumen to meet a modern market environment (including value adding to raw production). | Ongoing                  | ABARES, industry bodies, R&D organisations, investment community                 |
| Identify opportunities and models for new forms of ownership and governance over rural land assets and other assets underpinning industry (e.g. access and property rights). | • Undertake a review of the proposed and potential new models for shared-asset governance in the rural setting and identify the degree to which the current and potential new ownership structures of real assets, their divisibility, and liquidity can better meet the needs of joint ownership and equity investors. | Next 2 – 3 years          | Researchers in conjunction with industry bodies and investment community          |
### The journey to growth and investment

<table>
<thead>
<tr>
<th>Issue / impediment</th>
<th>Initiative / action</th>
<th>Timeframe for completion</th>
<th>Potential lead(s)</th>
</tr>
</thead>
</table>
| ESG and environmental markets to diversify cashflow and investment risk. Emergence of new environmental finance products and opportunities for enterprise-scale on-farm natural capital products have the potential to open up new pools of capital for Australian agricultural, fisheries and forestry enterprises. | - Undertake programs with producers enhance awareness of existing and emerging opportunities in environmental markets (e.g. carbon markets).  
- Continue to enrich environmental market operations including information provision and aggregation services.  
- Accelerate current efforts to establish robust and cost-effective metrics to inform investment in ESG and environmental markets. | Next 2 – 3 years         | Environmental; market developers and regulators, researchers in conjunction with investment community |
| Address liquidity concerns of institutional investors. Institutional investors have concerns regarding the liquidity of agriculture, fisheries and forestry assets within regulated portfolio management requirements. | - Commission additional research to investigate the materiality of the current liquidity requirements as an impediment to investment on agriculture, forestry and fisheries assets.  
- Based on findings develop appropriate actions (e.g. information, policy or regulatory changes). | Next 2 – 3 years         | Researchers in conjunction with institutional investment community and regulators. |
| Address FIRB complexity perceptions. FIRB requirements can create a perception of complexity, driving investor uncertainty in some cases. | - Investigate the materiality of the current FIRB requirements as an impediment to investment on agriculture, fisheries and forestry assets.  
- Identify potential means to promote and streamline the FIRB process for foreign investors, as well as asset managers in Australia managing foreign capital (e.g. information, policy or regulatory changes). | Next 2 – 3 years         | Researchers in conjunction with institutional investment community and regulators. |


Customer Owned Banking Association. (2017) APRAIs proposed Agricultural Lending Data collection (ARP 750.0). Submission to Australian Prudential Regulation Authority.


References


Appendix A

Stakeholder consultations

Our approach to the overall analysis required an estimate of production out to 2030 as a baseline for aggregate demand for Australian production (see Section 2 of this report). From this, we modelled the capital investment required to underpin the increased productivity needs to meet the growth target.

A detailed and largely product-based approach was used to establish a baseline, which is presented as an aggregate baseline in the report.

Assumptions and principles

Table 7 contains the principles that were used to determine the reporting of demand by product groupings. It should be noted that, although results are presented in these groupings, the calculations underpinning them have been estimated on a disaggregated basis.

Table 7 Principles and rationale underpinning product reporting

<table>
<thead>
<tr>
<th>Workshop</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment with current industry / Research and Development Corporation (RDC) groupings</td>
<td>Policy tends to be developed based on these groupings and this project is intended to contribute to policy formulation.</td>
</tr>
<tr>
<td>Focus on drivers of growth</td>
<td>Export markets are, in most cases, likely to be the driver of growth in demand for many commodities. Therefore, the product categories should reflect export-ready products. This often infers at least a moderate level of product transformation for some commodities.</td>
</tr>
<tr>
<td>Avoiding large ‘other’ categories</td>
<td>The groupings need to have sufficient disaggregation to avoid large undefined ‘other’ categories.</td>
</tr>
<tr>
<td>Consideration of existing datasets</td>
<td>The groupings need to be consistent with recognised, publicly available datasets across all components of the demand assessment methodology, (e.g. exports, imports, and consumption datasets).</td>
</tr>
</tbody>
</table>

Using these principles, Table 8 presents the groupings used to estimate demand, whether moderate product transformation is required for market access, and the product valuation basis.  

\[17\]The valuation basis is used to inform estimates of current turnover and future production growth potential.
Table 8 Product groupings and transformation for consumer market

<table>
<thead>
<tr>
<th>Product</th>
<th>Farm gate product</th>
<th>Primary customer product</th>
<th>Moderate transformation (y/n)</th>
<th>Valuation basis - FOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>Raw cotton</td>
<td>Baled cotton, lint and cotton seed</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Dairy</td>
<td>Milk</td>
<td>Milk powder and cheese</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Eggs</td>
<td>Eggs</td>
<td>Eggs, powdered and liquid eggs</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Fish and crustacean</td>
<td>Live products and seafood</td>
<td>Yes (for seafood products)</td>
<td>Export value</td>
</tr>
<tr>
<td>Forestry</td>
<td>Logs</td>
<td>Timber, pulp and paper</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Grains</td>
<td>Grains</td>
<td>Grains and flour</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Horticulture</td>
<td>Fruit, vegetables and nuts</td>
<td>Fruit, vegetables and nuts</td>
<td>No</td>
<td>Export value</td>
</tr>
<tr>
<td>Other meat</td>
<td>Pork, chicken and goat</td>
<td>Meat products</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Red meat</td>
<td>Beef and sheep</td>
<td>Live exports and meat products</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Sugar</td>
<td>Sugarcane</td>
<td>Processed sugar</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Wine</td>
<td>Grapes</td>
<td>Wine</td>
<td>Yes</td>
<td>Export value</td>
</tr>
<tr>
<td>Wool</td>
<td>Wool</td>
<td>Baled wool</td>
<td>No</td>
<td>Export value</td>
</tr>
</tbody>
</table>

Approach to estimating baseline

Our approach is established on a commodity demand forecast for both domestic and export markets.

Stage 1 involved collating and analysing population estimates, production quantities, import quantities, export quantities, export quantities by destination and export values by destination. These have been summarised at the trading partner level, keeping individual commodities separated.

Stage 2 of this approach focused on understanding consumption at a trading partner level, where consumption is equal to domestic production in the country, plus imports less exports for each commodity. The approach excludes commodities for which there is trade data, but no production data as these tend to be the more processed commodities e.g. there is production data for eggs, in-shell, but export data includes liquid and dried eggs.

Stage 3 translates consumption volumes into a per capita value, as population growth is the primary driver of future consumption. We have calculated consumption per capita on the basis of consumption given the population in a given year. The most recent year’s consumption per capita for a commodity was held constant out to 2030 unless it was out of trend, in which case the most recent 5-year average was used.

Stage 4 translates volume forecasts into priced values by commodity. Prices are calculated as export value by destination over export quantity by destination:

---

18 Other category not included in this owing to the range of products included.
19 All data sourced from FAO http://www.fao.org/faostat/en/#data
1. Due to time lags in data and other data issues, prices were calculated as average annual value divided by the average annual quantity. That is, if value/quantity is calculated for individual years the prices look unreasonably volatile\(^\text{20}\). The process used reduces some of this volatility as we are interested in understanding long-term trends rather than short-term volatility.

2. Australia’s domestic prices were calculated as the average of the export prices. This assumes that markets are efficient in allocating resources between domestic and international sales. This was done due to a lack of data on production values for all commodities, particularly where some degree of product transformation is undertaken e.g. grapes to wine.

3. The most recent 5-year average price was used as the price for each projected year out to 2030.

4. Prices were in USD and therefore the US GDP deflator was used to convert prices into 2019 USD.

Stage 5 and 6 examined the share of domestic and export markets to determine Australia’s trading position, both to individual markets and globally:

1. This was calculated as Australia’s exports of a given commodity to a given trading partner divided by that trading partner’s total consumption of that commodity.

2. Domestic market share was calculated as 1 - (imports over consumption) or alternatively (consumption-imports) over consumption.

Domestic and market shares for key commodities and markets provide a means to frame the consultation with industry experts (e.g. does industry expect to lose/ maintain/grow market share for a specific market based on industry insight into the destination market and Australia’s competitive advantage to meet those market needs into the future?).

Stage 7 involved the commodity volume forecast, bringing together the previous stages of this approach to project commodity quantities from 2018 to 2030, calculated for each trading partner using the formula of Quantity = Market Share x Population x Consumption per capita for each year in the forecast.

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\(^\text{20}\)See http://fenixservices.fao.org/faostat/static/documents/TM/TM_e.pdf for further information
Stage 8 estimated forecast values were projected onto forecast volumes in 2019 AUD at an exchange rate of AUD1.44 : USD1.

Stage 9 involved overlaying the forecasts with expected changes in consumption per capita for the various commodity groupings. This was done to incorporate the effect of the changing population composition (i.e. rural vs urban population). It was achieved by:

1. First, aggregating domestic supply quantities, rural and urban populations for Australia’s key trading partners.
2. Next, these were used as inputs to linear regressions which estimated the relationships between population and consumption for both rural and urban populations.
3. The results of these regressions were then used, in combination with the forecast rural and urban populations to forecast changes in consumption per capita.
4. The growth rates in consumption per capita were combined with the growth rates of demand due to population growth to obtain the total expected growth rate if market shares were held constant.
5. These growth rates were then applied to the ABARES gross value of production data to provide a forecast of the total demand for Australia’s agriculture, fisheries and forestry industry in 2030.

The regression analysis was undertaken using a linear regression to estimate the effect of changes in both rural and urban populations on changes in the consumption levels for different commodity groupings. The general simple regression formula is represented as follows:

\[ y = \sum_{i=1}^{n} b_i x_i + \varepsilon \]

Where \( y \) = consumption of a given commodity, \( b_i \) is the coefficient of \( x \), \( x \) is the independent variables (i.e. rural population and urban population), and \( \varepsilon \) is the error term.

Limitations of the approach

There were several data issues that affected the estimation process. The severity and type of data issue varied across commodities but, in general, these issues were related to:

- Mismatched production and trade data.
- Time lags in the data.
- Lack of domestic prices.

Workarounds to manage these data deficiencies included:

- Calculating Australia’s share of the market based on imports by destination countries rather than consumption.
- Averaging consumption per capita and prices.
- Placing restrictions around the estimates of market shares (e.g. between 0% and 100%).

A limitation of this approach is that it is likely to make results appear more volatile in the short run, but further assessments showed that the overall differences in magnitudes of projections were non-material.
Baselines were calculated for all key commodities and then aggregated to establish an aggregated baseline. The process used for one commodity, wine, is included for illustrative purposes.

**Wine – Illustrative example of approach taken for all commodity groups**

The wine category includes all types of wine (i.e. red and white) and is measured in kilograms.

**Consumption per capita**

In general, consumption per capita of wine has plateaued or is slowly falling for those trading partners with high levels of consumption per capita, while many of the partners with lower consumption have been steadily growing. Figure 20 shows the changes in consumption per capita over time for each trading partner and the levels used for the baseline projections to 2030.

![Consumption per capita of wine by trading partner – 5 year moving average](source: NCEconomics, based on FAOSTAT data.)
Market shares

Australia supplies a large proportion of its own market and has varied levels of penetration in export markets. Australia’s largest export markets tend to be those of New Zealand, Hong Kong, Taiwan and ASEAN trading partners. Figure 21 shows the historical market shares and the average market shares used for the projections to 2030.

Figure 21
Australia’s market share of export markets by trading partner wine

Source: NCEconomics, based on FAOSTAT data.
Prices

There are large variations in wine prices across trading partners, with Hong Kong paying Australia higher prices (projected value of over $8/kg) than all other trading partners, while the European Union and countries in the other category are estimated to pay the least (projected value of less than $2/kg).

Projections

The projections of potential production value based on quantity demanded indicate that there is potential for some growth in the wine sector, largely driven by population growth in the domestic market, and assuming per capita consumption patterns remain unchanged. The estimated values and growth rates for different time horizons are reported in Table 9. It is estimated that the current value of production of wine could grow from $6.05 billion in 2020 to $6.56 billion in 2030.

Figure 22

Historical average and projected real prices of wine by trading partner

Source: NCEconomics, based on FAOSTAT data.
The path of the value of wine production for the domestic market is shown in Figure 23. The trend over time is again reflective of the expected growth of Australia’s population.

The estimated values of production going to the various export markets also have trends reflective of the population growth of different trading partners. This is shown in Figure 24. The historical data is quite volatile and therefore 5-year averages are displayed to remove some of the noise in the data.

The path of the value of wine production for the domestic market is shown in Figure 23. The trend over time is again reflective of the expected growth of Australia’s population.

<table>
<thead>
<tr>
<th></th>
<th>2020 (current)</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019 AUD billions</td>
<td>$6.05</td>
<td>$6.56</td>
</tr>
<tr>
<td>Average growth rate from 2020</td>
<td>-</td>
<td>0.84%</td>
</tr>
</tbody>
</table>

Source: NCEconomics, based on FAOSTAT data.

The estimated values of production going to the various export markets also have trends reflective of the population growth of different trading partners. This is shown in Figure 24. The historical data is quite volatile and therefore 5-year averages are displayed to remove some of the noise in the data.

The trends in population growth indicate that Australia’s export value of wine will come largely from China, the United States and countries in the other category by 2030. This is shown in Figure 25, where the export value of wine in 2030 is split by destination.
It is important to note that, while these countries will be the destination for a large portion of Australia’s export value, the majority of the total value will likely still come from the domestic market.

The average annual growth rate in the total production value of the wine industry (0.84%) was then combined with the expected growth rate in consumption per capita (-1.03%) to get an estimated annual growth rate of -0.20%. This growth rate was then applied to the ABARES gross value of production data for the wine industry to obtain estimated change in production value from $0.77 billion in 2020 to $0.76 billion in 2030.

Figure 24
Estimated production value of wine for export markets
Source: NCEconomics estimate, based on FAOSTAT data.

Figure 25
Estimated share of export value of wine by destination in 2030
Source: NCEconomics, based on FAOSTAT data.
The trends in population growth indicate that Australia’s export value of wine will come largely from China, the United States and countries in the other category by 2030.
To understand the role of capital in supporting sector growth, it was first necessary to gain an understanding of the different ways in which capital is defined and measured. This section provides supplementary information to Chapter 3.

The sector’s capital stock

The capital stock of the sector has grown over the past 30 years, as seen in Figure 12 (ABS 2019). The value of capital stock in the sector is estimated at $505 billion in 2019 (ABS, 2019). This estimate has been calculated by combining the net capital stock
c of these industries with the value of rural land.

Measuring capital stock

There are a number of different ways of considering capital, including the ‘wealth’ approach and the ‘productive capacity approach’. The wealth approach measures the value of the capital stock, similar to a company balance sheet (ABS, 2000). The productive capacity approach involves calculating the value of productive capital stock and developing an index of the level of capital services generated from that stock (ABS, 2000). Importantly, the capital service index, as opposed to productive capital stock, provides a more meaningful way to view productive capacity through time. This is because, when aggregated, productive capital stock does not capture the variations that occur between assets in terms of the level of service they provide over their lifetime (Hill, 1999).

Figure 26 illustrates the growth in the sector’s capital stock of the sector over the past 30 years. This growth has been predominantly driven through appreciation of rural land value, rather than through growth from investments that directly underpin growth in output (e.g. investment in machinery and equipment, non-dwelling construction or R&D). While this gain in land values can make accessing capital easier (stronger balance sheet), it does not necessarily translate to better cashflow and profitability.

The level of capital investment impacts the level of capital stock from both a wealth and productive capacity perspective (OECD, 2009). However, growth in asset prices without any changes to the amount of capital services those assets provide impact wealth, but not productive capacity.

Net capital stock estimates the written down value of an economy’s assets but does not include land (ABS, 2000).
In 2019, the nation’s stock of rural land was valued at $359.6 billion, which equates to 6.3% of Australia’s total land value (ABS, 2019). At this valuation, rural land makes up 71% of the capital stock value in the sector. In 1989, land contributed 50% of capital stock.

New South Wales and Victoria account for the greatest total rural land value, with the most significant land value appreciation in New South Wales, in particular over the past five years (Figure 27).

In 2019, the total area of farmland traded across New South Wales was approximately 1.35 million hectares and while the area of land traded was down by 14.5% on the previous year, prices increased. Median price per hectare of New South Wales farmland increased by 17.2% year on year, in 2019 to $5,066 per hectare (RuralBank, 2020). Land use change (e.g. horticulture to urban) is also occurring at the fringes of cities, where land prices are driven by the urban use of the land rather than the underpinning production values. While the areas can be relatively small, prices paid can be high.

However, investment in real estate does not in itself generate an increase in productivity. It represents a transfer of ownership. In an efficient market, land prices should reflect the long-term capacity to generate commercial returns in conjunction with other factors of production (e.g. financial capital, labour). Rising land values can reduce reported cashflow rates of return. However, they can also increase the value of security for lenders.

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Figure 26
Trends in capital stock in the Australian agriculture, fisheries and forestry sector (nominal values)

Rural land’s contribution to capital stock

In 2019, the nation’s stock of rural land was valued at $359.6 billion, which equates to 6.3% of Australia’s total land value (ABS, 2019). At this valuation, rural land makes up 71% of the capital stock value in the sector. In 1989, land contributed 50% of capital stock.

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In 2019, the total area of farmland traded across New South Wales was approximately 1.35 million hectares and while the area of land traded was down by 14.5% on the previous year, prices increased. Median price per hectare of New South Wales farmland increased by 17.2%,

1 Includes livestock raised for breeding, dairy, wool, and vineyards, orchards and other plantations of trees yielding repeat products. Immature cultivated assets are excluded unless produced for own use.
Measuring the value of rural land

The ABS provides a value for rural land as part of the Australia System of National Accounts. This value is based on data from State and Territory Valuers-General offices (ABS, 2006). The NSW Valuer-General (2019) defines rural land as land:

- “zoned rural under a Local Environmental Plan, or

- wholly or mainly used for one or more of the activities of grazing, animal feed lots, dairying, pig farming, poultry farming, viticulture, orcharding, beekeeping, horticulture, the growing of crops of any kind, or forestry. Rural land also includes areas which are wholly or mainly used for aquaculture within the meaning of the Fisheries Management Act 1994.”

Figure 27

Estimated value of rural land in Australian states and territories (in real FY19 $billions)

Source: ABS (2019)
Investment in the sector

Investment (along with price improvements and increased demand) underpins growth by facilitating production expansion and productivity improvements. Between 2009 and 2019 average business investment in the sector (as measured by gross fixed capital formation, GFCF\(^\text{22}\)) was between $10.6 billion to $13.2 billion per annum in real prices, and averaged $12.2 billion (ABS 2019) (see Figure 28). This includes investment in fixed assets such as non-residential buildings, farm machinery and breeding stock.

Depreciation (or the consumption of fixed capital) is an important aspect of investment. Over the past 10 years, depreciation has been $12.6 billion per annum on average (ABS, 2019). This indicates that over the past decade the level of investment has not been keeping pace with the consumption of capital stock. While it is acknowledged that investment has been adversely impacted by external events such as the millennium drought and the GFC, external shocks are a major feature of the sector and may only get worse in the longer-term (e.g. under climate change).

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\(^{22}\) Gross fixed capital formation is the value of acquisitions less disposals of new or existing fixed assets (such as non-residential buildings, machinery, livestock raised for breeding). Assets consist of tangible (such as vehicles or sheds) or intangible assets (such as computer software or patents) that have come into existence as outputs from processes of production. Importantly they are used repeatedly or continuously in other processes of production over periods of time longer than one year. The acquisition of non-reproducible tangible assets such as land and natural timber tracts is not included in gross fixed capital formation. However, capital costs associated with the extension or development of these assets are included.
Capital services

The productivity impacts of new capital deployment into the sector, and the productive services that such capital provide farming enterprises over time, can be used to create an index of the level of capital services available in a sector.

Figure 29 shows how the level of capital services in the agriculture, fisheries and forestry sector has increased over time. Over the last 30 years, capital services in the sector have grown by less than 4%, which is significantly less than the growth seen in other industries, such as mining and manufacturing. This demonstrates that recent business investment, on average $12.2 billion annually over the last 10 years, combined with growth in wealth through higher land values has done little to boost the sector’s productivity.

Defining capital services

The OECD (2001) describes capital services as the “flow of productive services provided by an asset that is employed in production”. The index therefore captures the relative level of productive services being provided as opposed to the monetary value of such services. The index therefore allows capital inputs to be compared between periods.

The capital services index is derived from the gross capital stock, valuing all assets in an industry at the current price of new assets, taking into account asset depreciation and adjusting valuations to reflect the current level of effectiveness of assets relative to a new asset (ABS, 2000; Hill, 1998). Productive capital stock is then used to estimate the level of capital services at any one time, through the capital services index.

Figure 29

Capital service index for agriculture, fisheries and forestry vs mining and manufacturing

Source: ABS (2019)
While the quantum of capital services available to agriculture, fisheries and forestry has grown, the rate of growth is significantly slower than mining and manufacturing. This both constrains the rate of growth in productivity (supply side constraint), but also reflects the perceived relatively poorer performance capital investment in the sector.

> Multifactor productivity and net capital formation

The Australian Bureau of Statistics provides estimates of productivity in the agriculture, fisheries and forestry sector through use of indices encompassing capital, labour and multifactor productivity.

A rise in the capital productivity index indicates that there is a rise in the level of output per unit of capital input (ABS, 2018).

Figure 30 shows the change in these indices since 1989-90 and demonstrates that the sector in Australia has seen the most significant improvements in labour productivity over the past thirty years. Improvements in labour productivity are followed by multifactor productivity, suggesting the sector is improving its ability to combine technology with practices to innovate. Capital productivity is also improving, albeit less pronounced than other measures of productivity.

Changes in the capital productivity can be influenced by changes in other inputs, such as increased labour, and as such should not be viewed in isolation. Based on this evidence, increasing productivity appears to be responsible for at least a portion of the growth in gross value added within Australia’s agriculture, fisheries and forestry sector.

Figure 30
Productivity in agriculture, fisheries and forestry sector
Source: ABS (2019)
A key component of the analysis undertaken for this project was estimating the capital investment required to enable specific increases in production (i.e. for every $1 of capital investment, how much of an annual increase in production would be generated?). The following outlines how this was done.

**Relationship between capital investment and agricultural output**

A statistical analysis was undertaken based on growth in historical agricultural production and growth in net capital stock to investigate the effect of capital stock on Australian agricultural production.

Historical annual values of agricultural production and the productive capital stock were used to investigate the relationship that exists between capital formation (that underpins growth in output) and the value of agricultural output. The value of agricultural production was based on the Australian Bureau of Statistics’ reported gross value of agricultural production and it is estimated using price and quantity for agricultural produce (ABS, 2019a).

Productive capital stock estimates are measures of productive capacity and they form the basis for the measure of capital services required for productivity analyses (ABS, 2000). Productive capital stock estimates are derived by writing down each asset in accordance with its decline in efficiency due to age. Annual productive capital stock values were sourced from the Australian Bureau of Statistics’ System of National Accounts database and does not include the value of land (ABS, 2019b). The key components of productive capital stock are:

- Cultivated biological resources.
- Intellectual property and research and development.
- Inventories.
- Machinery and equipment.
- Non-dwelling construction.
- Ownership transfer costs.

Average annual rainfall was also included as a proxy for annual climate variability and the impact on production (e.g. drought vs good rainfall).

A Pearson’s product-moment correlation test was run to assess the relationship between the value of agricultural production and components of the productive capital stock between year 1990 and 2019. The correlation test results indicated that there is a strong and statistically significant relationship between all productive capital stock variables except ownership transfer costs and rainfall.

The pair-wise correlation also indicated that inventory was highly correlated with cultivated biological resources, and machinery and equipment, and thus was dropped from the regression. A composite productive capital stock made up of cultivated biological resources, intellectual property and research and development, non-dwelling construction, and ownership transfer costs was used as the independent variable.

Further analysis was then undertaken using a linear regression to estimate the effect of changes in productive capital stock on changes in the total gross value of agricultural production. The general simple regression is represented as follows:

\[
y = \sum_{i=1}^{n} b_i x_i + \epsilon
\]

Where \( y \) = annual value of agricultural production, \( b_i \) is the coefficient of \( x_i \), \( x_i \) is the independent variables (i.e. productive capital stock and rainfall), and \( \epsilon \) is the error term.\(^23\)

The linear regression results indicate that a net increase in productive capital stock of $1 billion in the agricultural, forestry and fisheries sector leads to an increase of $0.38 billion in total annual gross value of agricultural production. A 95% confidence interval range indicates that this value ranges between $0.19 and $0.56 billion.

\(^23\) Initial models included several specifications of climate variables and on average these were found to have no statistically significant impact on gross value of agricultural production.
The linear regression results indicate that a net increase in productive capital stock of $1 billion in the agricultural, forestry and fisheries sector leads to an increase of $0.38 billion in total annual gross value of agricultural production.
Insights from the agriculture, fisheries and forestry sector

Two distinct groups have been consulted as part of this project: representatives of the associations for the agriculture, fisheries and forestry sector and representatives of the investor community. This appendix outlines the key outcomes of the interviews with the sector, while Appendix F summarizes the outcomes from the interviews with the capital investment community.

Table 10 Agriculture, forestry and fisheries stakeholder interviewees

<table>
<thead>
<tr>
<th>Participant</th>
<th>Organisation</th>
<th>Role</th>
<th>Date of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Haydon</td>
<td>Australian Pork Limited</td>
<td>Executive General Manager - Operations</td>
<td>13-Jul</td>
</tr>
<tr>
<td>Justin Crosby</td>
<td>Grains Research Development Corporation</td>
<td>Head of Industry and Government Relations</td>
<td>1-Jul</td>
</tr>
<tr>
<td>Maximiliane Hanft</td>
<td>Grains Research Development Corporation</td>
<td>Industry and Government Relations Manager</td>
<td>1-Jul</td>
</tr>
<tr>
<td>Terence Farrell</td>
<td>Grains Research Development Corporation</td>
<td>Head of Economics</td>
<td>1-Jul</td>
</tr>
<tr>
<td>Noella Powell</td>
<td>Australian Eggs</td>
<td>Innovation Coordinator</td>
<td>29-Jun</td>
</tr>
<tr>
<td>Melinda Hashimoto</td>
<td>Egg Farmers of Australia</td>
<td>CEO of Egg Farmers of Australia</td>
<td>23-Jul</td>
</tr>
<tr>
<td>Rowan McMonnies</td>
<td>Australian Eggs</td>
<td>Managing Director</td>
<td>17-Jul</td>
</tr>
<tr>
<td>Tony Battaglene</td>
<td>Australian Grape and Wine Incorporated</td>
<td>Chief Executive</td>
<td>14-Jul</td>
</tr>
<tr>
<td>Debra Pearce</td>
<td>Northern Australia Crop Research Alliance</td>
<td>Executive Officer</td>
<td>2-Jul</td>
</tr>
<tr>
<td>David Rynne</td>
<td>Australian Sugar Milling Council</td>
<td>Director, Economics, Policy &amp; Trade</td>
<td>9-Jul</td>
</tr>
<tr>
<td>Crispian Ashby</td>
<td>Fisheries Research Development Corporation</td>
<td>General Manager, Research &amp; Investment</td>
<td>8-Jul</td>
</tr>
<tr>
<td>Chris Lafferty</td>
<td>Forest &amp; Wood Products Australia Ltd</td>
<td>R&amp;D Manager</td>
<td>25-Jun</td>
</tr>
<tr>
<td>Ric Sinclair</td>
<td>Forest &amp; Wood Products Australia Ltd</td>
<td>Managing Director</td>
<td>25-Jun</td>
</tr>
<tr>
<td>Jim Houghton</td>
<td>Forest &amp; Wood Products Australia Ltd</td>
<td>Statistics and Economics Manager</td>
<td>25-Jun</td>
</tr>
<tr>
<td>Matthew O’Bryan</td>
<td>Australian Meat Processor Corporation</td>
<td>Program Manager: Hygiene, Quality &amp; Meat Science</td>
<td>3-Jul</td>
</tr>
<tr>
<td>Alison Anderson</td>
<td>Horticulture Innovation Australia</td>
<td>General Manager, Research &amp; Development</td>
<td>8-Jul</td>
</tr>
<tr>
<td>Charles McElhone</td>
<td>Dairy Australia</td>
<td>Group Manager, Trade &amp; Industry Strategy</td>
<td>1-Jul</td>
</tr>
<tr>
<td>Stephen Feighan</td>
<td>Australian Wool Innovation</td>
<td>General Manager, Woolgrower Services</td>
<td>30-Jun</td>
</tr>
<tr>
<td>Tim Lester</td>
<td>Council of Rural Research Development Corporations</td>
<td>Executive Officer</td>
<td>26-Jun</td>
</tr>
</tbody>
</table>

Stakeholders consulted

Table 10 contains a list of representatives of the agriculture, fisheries and forestry sector that were interviewed as part of the project.
Key findings from the interviews

The following provides a summary of responses received to questions about the role of capital in the agriculture, fisheries and forestry sector during interviews with stakeholders. In addition to these questions, stakeholders were also asked questions about the sector baseline and future growth. The responses relating to these questions have been incorporated within Appendix A and B.

Is access to capital a constraint to growth for the sector?

Stakeholders had mixed responses to this question. Representatives of the eggs sector considered that capital is a constraint, citing that most of the sector comprises medium sized producers, with very few large producers. It is thought that capital would help to achieve economies of scale, but attracting capital (via banks) is problematic. Representatives of the Northern Australia Crop Research Alliance (representing the cotton sector) also considered capital to be a constraint, although this is from the perspective of the northern Australian.

Others (i.e. dairy, fisheries, pork) considered that capital was potentially a constraint. For example, fisheries representatives cited the lack of security over statutory fishing rights for wild catch operators being a major impediment to being able to access capital. Pork representatives indicated that growth is relatively more capital intensive than, say beef or sheep meat producers, because of the requirement to construct piggeries.

Forestry, grains, horticulture, sugar and wool sector representatives all considered capital was not a constraint to growth. Other factors, such as the time to see a return on capital (forestry and other horticultural tree crops), cost-effectiveness of loan terms (grains), regulatory burden (sugar), commodity prices (wool and sugar), were cited as bigger challenges to growth.

What part of the supply chain requires capital to support growth?

Stakeholders had mixed responses to this question, which spanned:

- On-farm: e.g. to achieve economies of scale and other efficiencies.
- Transportation/logistics: e.g. access to rail (cotton in northern Australia), grains (grain wagons) and broader cost of transportation (e.g. wool).
- Processing: e.g. cotton, forestry, grains, especially pulses, pork, wool.
- Value-adding: e.g. sugar (co-generation), fisheries, forestry, wool.

What is the relationship between capital investment and productivity?

Stakeholders were asked if there were any rules of thumb that reflect the relationship between a given increase in capital and productivity improvements. Most stakeholders found this a challenging question, as there are many factors that affect productivity and it is difficult to make generalisations across enterprise types and scales.

Notable exceptions were fisheries (aquaculture) and pork. For aquaculture, the relationship between increased surface area under production and output is well-established. For pork, a new processing facility with capacity to process approximately 45,000 animals would cost about $1.1 million.
What are the barriers to capital investment in the sector?

Stakeholders cited a number of barriers to investment, including:

- Scale of operations required (cotton).
- Production risk, e.g. drought and biosecurity (grains, pork, horticulture).
- Social licence (dairy, eggs, wool).
- Regulatory uncertainty / burden (eggs, sugar).
- Security of access and availability of resource (fisheries).
- Payback timeframes (forestry, meat processors).
- Supply chain integration (forestry).
- Commodity price volatility (pork, wine).

Are some types of capital investment more appropriate than others?

Stakeholders noted a number of factors determine the extent to which capital is available and appropriate. These include: scale of operations, degree to which operations are ‘corporate’ (compared to ‘family farms’), extent to which there is a track record of foreign investment is established within the sector (e.g. dairy, sugar).

Most stakeholders referred to the importance of debt as a capital investment instrument, particularly for smaller-scale operations. Some, (e.g. dairy, sugar, wine) referred to other capital instruments such as equity, share-farming, and venture capital.

What are the priorities for addressing the challenges in attracting appropriate capital?

Stakeholders cited a number of priorities to attract capital, including:

- Social licence (eggs).
- Supply chain integration (grains, forestry).
- Payback timeframes (forestry).
- Supply security (meat processors).
- Scale of operations (cotton, forestry- processing).
- Production and processing technology (pork, sugar, wool).

In addition, a number of stakeholders referred to the need to recognise the range of services provided by the sector, beyond the production of food and fibre. Examples of carbon sequestration and other ecosystem services were provided as areas which, with a functioning market, could support alternative investment streams.
A major focus of this project has been to elicit insight into the drivers and impediments to capital investment in the agriculture, fisheries and forestry sector, including when compared to opportunities to invest in other asset classes (e.g. commercial property). Appendix E outlines key findings from the background research and interviews with stakeholders from the investment community.

**Stakeholders consulted**

Table 11 contains a list of representatives of investor community that were interviewed as part of the project.

### Table 11 Investor community interviewees

<table>
<thead>
<tr>
<th>Participant</th>
<th>Organisation</th>
<th>Role</th>
<th>Date of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Whitehead</td>
<td>ANZ</td>
<td>Head of Agribusiness Insights</td>
<td>05-Aug</td>
</tr>
<tr>
<td>April Cavanagh</td>
<td>Suncorp</td>
<td>Head of Agribusiness at Suncorp Group</td>
<td>17-Jul</td>
</tr>
<tr>
<td>Simon O’Connor</td>
<td>Responsible Investment Association of Australia</td>
<td>Chief Executive Officer</td>
<td>29-Jul</td>
</tr>
<tr>
<td>Kim Morison</td>
<td>Argyle Group</td>
<td>Chief Executive Officer</td>
<td>21-Jul</td>
</tr>
<tr>
<td>Phil McFarlane</td>
<td>EAT Group</td>
<td>Founder and Director</td>
<td>17-Jul</td>
</tr>
<tr>
<td>Rebecca Wilson</td>
<td>Proterra Investment Partners</td>
<td>Managing Director - Agriculture</td>
<td>14-Aug</td>
</tr>
<tr>
<td>Frank Delahunty</td>
<td>F &amp; L Delahunty</td>
<td>Managing Director</td>
<td>04-Aug</td>
</tr>
<tr>
<td>Daniel Edwards</td>
<td>Rural Funds Management</td>
<td>National Manager - Rural Funds Group</td>
<td>20-Aug</td>
</tr>
<tr>
<td>Tim McGavin</td>
<td>Laguna Bay Pastoral</td>
<td>Chief Executive Officer</td>
<td>19-Aug</td>
</tr>
<tr>
<td>Cullen Gunn</td>
<td>Kilter Rural</td>
<td>Chief Executive Officer</td>
<td>28-Aug</td>
</tr>
<tr>
<td>Ed Peter</td>
<td>Duxton Capital Australia</td>
<td>Group Chairman</td>
<td>24-Aug</td>
</tr>
<tr>
<td>Bruce King</td>
<td>Australian Government Regional Investment Corporation</td>
<td>Chief Executive Officer</td>
<td>21-Aug</td>
</tr>
<tr>
<td>James White</td>
<td>Future Fund</td>
<td>Director, Infrastructure &amp; Timberland</td>
<td>03-Sep</td>
</tr>
<tr>
<td>Justin Ginnivan</td>
<td>Future Fund</td>
<td>Director, Infrastructure &amp; Timberland</td>
<td>03-Sep</td>
</tr>
<tr>
<td>Will Hetherton</td>
<td>Future Fund</td>
<td>Head of Public Affairs &amp; Strategic Relations</td>
<td>03-Sep</td>
</tr>
<tr>
<td>Martijn Wilder</td>
<td>Pollination</td>
<td>Founding Partner</td>
<td>22-Sep</td>
</tr>
<tr>
<td>Heechung Sung</td>
<td>Macquarie Infrastructure and Real Assets (MIRA)</td>
<td></td>
<td>04-Sep</td>
</tr>
<tr>
<td>Phin Ziebell</td>
<td>NAB Agribusiness</td>
<td>Agri Economist</td>
<td>17-Sep</td>
</tr>
</tbody>
</table>
Summary

• The agriculture, fisheries and forestry sector is viewed by investors as mid-risk opportunity, providing both growth and defensive characteristics.

• Agricultural investments have attractive investment characteristics in that the asset class is not correlated with the financial markets; can enhance wealth preservation; provides a hedge against inflation as well as currency protection; and can provide a pathway into ESG and sustainability investments.

• Investment in Australian agriculture, fisheries and forestry has gained acceptance and is expected to continue to grow as a stand-alone asset class.

• 25% (or USD$41 billion) of current global agricultural AUM with some of the larger investors have potential for investment in Australia. It is expected that much of this capital is already deployed in existing long-term assets globally.
• The top Australian agricultural asset managers currently manage an estimated USD$9.3 billion in AUM.

• The majority of Australian investments are through real asset and private equity investment strategies, with most investors wanting exposure to the underlying water or farmland assets.

• Two dominant value creation approaches in the sector are farmland aggregation for scale and production of premium products linked into bespoke supply chains and advance purchasing agreements with buyers of the resource.

• A lack of institutional quality information on the sector, regulatory barriers including liquidity requirements for Australian superannuation funds, and treasury review and approval processes (through FIRB) for foreign investors are cited as three barriers to investment in the sector; with some efforts underway to improve the availability of institutional quality data.

• More generally, it has been frequently cited that there is a general misperception of the sector across Australian investors, where the sector is characterised by the “battler farmers”, hardship, subsidy and drought, often fueled by the media portrait.
This section provides an overview of findings from research and interviews with domestic and international investors and asset managers with a focus on Australian agriculture, fisheries and forestry investments.

**Investors’ perspectives**

Agriculture, fisheries and forestry assets are assessed by investors using similar procedures to other assets classes within a diversified portfolio of opportunities. Globally, institutional investors view the agriculture, fisheries and forestry sector as mid-risk, providing both growth and defensive characteristics, and identify that allocations into the sector can diversify portfolios into assets that:

- Are not correlated with the financial markets.
- Enhance wealth preservation.
- Provide a hedge against inflation and currency protection.
- Provides a pathway into environmental, social and governance (ESG) and sustainability investments.

The agriculture, fisheries and forestry sector is a pillar of the foundational economy globally that attracts institutional capital into agribusiness and farmland assets. However, investment in the sector is challenged by a lack of high quality and timely data. Whilst official government statistical publications exist, the timing and methodology of collection does not meet the needs of institutional investors. In addition, many agriculture, fisheries and forestry assets are too small or provide insufficient returns to attract the attention of institutional investors (e.g. many family farms). Where those assets dominate the reported statistics, a cursory glance at the agriculture, fisheries and forestry asset class indicates an underperforming class. Investment in Australian agriculture, fisheries and forestry has gained acceptance and is expected to continue to grow as a stand-alone asset class, as financial returns and non-financial outcomes are better understood by institutional investors, and as more transactions in the sector are completed.

→ Significant improvement in the collection, analysis and distribution of agriculture, fisheries and forestry data (including more granular reporting by asset sub-class and the distribution of performance) is required to bring information on the agriculture, fisheries and forestry asset class required to attract interest by investors.

**Funds raised for investment in the Australian agriculture, fisheries and forestry sector**

**Global capital focused on the Australian sector**

The HighQuest Global AgInvesting Rankings and Trends Report (2019) identifies the total aggregated agriculture, fisheries and forestry AUM held by 698 investors globally was USD$131 billion in 2019. Capital allocated to the top 14 funds with potential for deployment into the Australian agricultural, fisheries and forestry sector, as well as other global investment destinations, was approximately USD$32 billion, or 25% of the global capital pool allocated to investment in the sector. It should be noted that this capital pool is shared across upstream and downstream investment opportunities, including upstream investment into inputs and AgTech, investment into primary production real assets and agribusiness operations, to downstream value-added food production investments.

The top 14 global multi-strategy, private equity and farmland (including aquaculture and forestry) investors with a geographic focus that includes Australia are provided in Table 12.
### Table 12: Ranking of global agricultural fisheries and forestry investors with an Australian focus (2019)

<table>
<thead>
<tr>
<th>Global Agri Investor with Australian Focus</th>
<th>Investor Type</th>
<th>Investment Strategy</th>
<th>Total agri-assets under management (USD$ billions)</th>
<th>HQ Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westchester (Nuveen)</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$8.5</td>
<td>USA</td>
</tr>
<tr>
<td>Hancock Natural Resource Group</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$3.1</td>
<td>USA</td>
</tr>
<tr>
<td>Proterra</td>
<td>Asset Manager</td>
<td>Credit / Debt; Private Equity; Farmland</td>
<td>$2.9</td>
<td>USA</td>
</tr>
<tr>
<td>PSP Investments</td>
<td>Superannuation Fund</td>
<td>Farmland</td>
<td>$2.7</td>
<td>Canada</td>
</tr>
<tr>
<td>CITIC Agriculture</td>
<td>Asset Manager</td>
<td>Private Equity; Venture Capital</td>
<td>$2.5</td>
<td>China</td>
</tr>
<tr>
<td>Paine Schwartz Partners</td>
<td>Asset Manager</td>
<td>Private Equity</td>
<td>$2.4</td>
<td>USA</td>
</tr>
<tr>
<td>The Rohatyn Group</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$2.1</td>
<td>USA</td>
</tr>
<tr>
<td>UBS Farmland Investors</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$1.5</td>
<td>USA</td>
</tr>
<tr>
<td>New Zealand Superannuation Fund</td>
<td>Sovereign Wealth Fund</td>
<td>Farmland; Private Equity</td>
<td>$1.5</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Equilibrium Capital Group</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$1.1</td>
<td>USA</td>
</tr>
<tr>
<td>Versus Capital</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$1.0</td>
<td>USA</td>
</tr>
<tr>
<td>Altima Partners</td>
<td>Asset Manager</td>
<td>Farmland; Private Equity</td>
<td>$0.9</td>
<td>UK</td>
</tr>
<tr>
<td>Duxton Asset Management</td>
<td>Asset Manager</td>
<td>Farmland; Private Equity</td>
<td>$0.6</td>
<td>Singapore</td>
</tr>
<tr>
<td>Aquilla Capital</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$0.5</td>
<td>Germany</td>
</tr>
<tr>
<td><strong>TOTAL USD AUM</strong></td>
<td></td>
<td></td>
<td><strong>$31.3 billion</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: HighQuest (2019)
Australian based funds focused on the agricultural sector

The HighQuest Global AgInvesting Rankings & Trends Report (2019) identifies the top seven agricultural investors with headquarters in Australia or New Zealand and with aggregate AUM of USD$9.37 billion for agricultural, fisheries and forestry related investments, representing 7% of global agricultural AUM. Note: This is not a census of all investors, rather a presentation of some of the larger investors.

While Australia enjoys one of the highest savings rates per capita globally, the parliamentary enquiry into Australian superannuation fund investment into agriculture identified less than 0.1% of total capital was allocated for agriculture, fisheries and forestry investment. Capital allocations need to fit with the risk adjusted rates of return that the sector can offer, and institutional quality information is a foundational requirement to improve the flow of capital.

Table 13 Australian headquartered investors focused on the agricultural fisheries and forestry sector (a selection of the largest investors)

<table>
<thead>
<tr>
<th>Australian Headquartered Agri Investor</th>
<th>Investor Type</th>
<th>Investment Strategy</th>
<th>Total agri-assets AUM (in USD$ Billion)</th>
<th>HQ Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Government Future Fund</td>
<td>Sovereign</td>
<td>Farmland, Infrastructure Fund, Private</td>
<td>$2.7</td>
<td>Melbourne</td>
</tr>
<tr>
<td>Macquarie Infrastructure and Real Assets</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$2.2</td>
<td>Sydney</td>
</tr>
<tr>
<td>Warakirri</td>
<td>Asset Manager</td>
<td>Farmland, Private Equity</td>
<td>$1.4</td>
<td>Melbourne</td>
</tr>
<tr>
<td>Rural Funds Management</td>
<td>Asset Manager</td>
<td>Farmland, Private Equity</td>
<td>$1.2</td>
<td>Canberra</td>
</tr>
<tr>
<td>Argyle Capital</td>
<td>Asset Manager</td>
<td>Real Assets; Private Equity</td>
<td>$0.6</td>
<td>Brisbane</td>
</tr>
<tr>
<td>Kilter Rural</td>
<td>Asset Manager</td>
<td>Farmland</td>
<td>$0.5</td>
<td>Bendigo</td>
</tr>
<tr>
<td>Laguna Bay Pastoral</td>
<td>Asset Manager</td>
<td>Farmland, Private Equity</td>
<td>$0.39</td>
<td>Brisbane</td>
</tr>
<tr>
<td>BridgeLane Agriculture Partners</td>
<td>Asset Manager</td>
<td>Farmland, Private Equity</td>
<td>$0.38</td>
<td>Sydney</td>
</tr>
<tr>
<td><strong>TOTAL USD AUM</strong></td>
<td></td>
<td></td>
<td><strong>$9.37 billion</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: HighQuest (2019)

While by no means an exhaustive list, the Global AgInvesting rankings has identified USD$9.37 billion AUM in Australia’s agriculture, fisheries and forestry sector which in itself represents a relatively small pool of domestic institutional investment capital in comparison to the overall annual investment needs of the sector.
Interviews with Australian asset managers identified that raising capital for the sector from domestic sources was made more difficult by the ‘three-day rule’ regulatory requirements on superannuation funds to maintain a proportion of liquidity. This means that investors need to be able to pull large amounts of capital out of investments relatively quickly. In contrast to an investor’s exit from listed equity positions on a stock market, it is not uncommon for an asset manager to take more than 12-24 months to exit a real asset investment in infrastructure, and longer for private equity exits in agriculture, fisheries and forestry, which may have an investment case of a 3-5 year timeframe for enterprise transformation.

There is therefore some misalignment of Australian institutional investor parameters and the needs for patient capital in the agriculture, fisheries and forestry sector at the farmgate level. This issue is not as significant for some international institutional investors such as the Canadian and Scottish pension funds where individuals’ superannuation savings are not as mobile, so the need to rapidly re-balance portfolios to maintain liquidity requirements has a lesser effect on capital allocation decisions.

This means that investment structures are required that can enable scaling up and down of investment positions. Water funds have achieved this because the asset is easily divisible. Selling off physical assets within a portfolio, divesting business units, and sub-dividing farmland are all possible, however more complex and cannot be executed with immediate effect.

Capital deployment scale is another challenge. With investment tranches that can typically range from $50 million to $100 million and above, the issue in real asset portfolios is that the scale of investment can be a ‘one-shot’ with a focus on which farms to acquire and aggregate. The scale also consolidates and increases property risk and as aggregation continues and deal sizes increase, and the market for exits to domestic buyers decreases. Exiting large-scale farmland property positions will require a market of buyers that will need to include international investors to ensure depth in the market and some degree of competitive tension.

Figure 31 shows some of the larger land transactions across Australia in recent years.

For institutional investors to establish agriculture as a non-correlated diversifier to their asset portfolio, significant investment scale, i.e. in the order of several billion dollars, is required to make it worthwhile. As deals increase in size, smaller investment opportunities become less attractive. To investment teams, the cost of running a small transaction can be on par with the cost of running a large transaction, in terms of due diligence and analyst time.

![Figure 31](https://example.com/figure31.png)

**Recent high value land transactions in Australia**

Source: Published online news articles

1 sale of 80%  2 Jemalong Station, Jemalong Citrus & Merrowi
Investment strategies

Outside initial public offerings (IPOs), investments in production businesses have been historically less liquid than other operating structures. The providers of new capital typically seek sustainable returns over time and to attract a broader pool of potential investors, contemporary business models are needed.

Agriculture is a long-term investment and private long-term capital is the most common form of equity in Australian agriculture, fisheries and forestry assets and for agribusinesses operating in the sector. Investors are seeking value in well-run entrepreneurial enterprises and often seek to build strong and long-term partnerships with operators.

Capital raising through public equity markets has seen mixed success. Many asset managers believe public equity is not well suited to the agricultural asset class. One reason for this is that public equities often trade at discounts to real tangible assets, discounted for risk, asset liquidity and volatility.

Transaction costs of investment and exit are relatively high for agriculture, fisheries and forestry assets. This can form an impediment to investment.

Managers cannot enter and exit a private equity position as they can in public equities. With maximum State Stamp Duty rates on asset transactions ranging from the lowest of 4.5% in Tasmania to the highest of 5.95% in the Northern Territory, there is a relatively high cost of transaction to get into a property, in contrast to 0.5% to get into equities. Furthermore, surcharges of an additional 7-8% is applied to foreign investors (PWC, 2020). The relatively high transaction costs create result in unfavourable internal rates of return for the asset class when compared to equities.

Within Australia domestic investors are established across all investment strategies and a number of investors are pursuing more than one investment strategy. Whether within a fund, or across multiple funds under management, our interviews identified that it was common for asset managers to be focused primarily on farmland investing. For asset managers pursuing a farmland strategy, allocations of a small percentage (referred to as a ‘sleeve’) of the fund to pursue a private equity or venture capital strategy on the farmland asset is also in practice. This means that investors will often seek to fund an investment in the improvements to business operations or new product development whilst developing the farmland asset itself. However, in a practical sense, most investors will seek exposure to the capital gain potential of the underlying farmland asset, for example even when the investment strategy is in improvements to on-farm processes.

The five most common investment strategies in the Australian agriculture, fisheries and forestry sector are real assets, which include water, farmland and infrastructure; private equity, which includes operating strategies and changes in land use; credit / debt; venture capital, including into AgTech and BioTech; and impact investment, which for the purposes of this report includes the continuum of investment from ESG to sustainability to impact. These are outlined below.

Liquidity requirements for Australian superannuation funds, and treasury review and approval processes (through FIRB) for foreign investors are cited as barriers to investment in the sector; with some efforts underway to improve the availability of institutional quality data.

Multiple strategies for investment are already in use, this includes real assets (including water, farmland and infrastructure), private equity, credit/debt, venture capital and impact investment.
Real assets (water, farmland, infrastructure)

With a rapidly growing global population, investors expect increasing demand for food and thus agricultural land. Farmland and water are key strategies for investors, with the top ranked agri-investors headquartered in Australia or New Zealand taking positions in farmland (Rankings Report, 2019). The demand for real assets, capital appreciation and large capital scale presents investment attraction challenges for wildcatch fishers and other operations on some leased lands.

Models for farmland real asset investment include sale and lease-back; own and operate; and co-investment. Asset managers consulted as part of this project suggest that the majority of investors want exposure to farmland assets and the degree to which investors are basing decisions on forecast operating returns appears to vary. Without a change in management processes and/or further investment, the investor is purely focusing on capital gain – and that cash flows are ‘icing on the cake’.

The sale and lease back model has proven successful for the Rural Funds Group, which has 22 years’ experience operating $1 billion in assets through an ASX listed diversified agricultural property trust. The model gives investors access to reliable income with some insulation from the underlying agriculture risk. Rural Funds Group also supports tenants in conversions and capital recycling from mature crops into new crops with potential for greater value, for example shifting from annual low value irrigated crops to macadamia (typically involving significant investments in on-farm infrastructure to underpin production, packaging and/or some value adding).

Co-investment models are becoming popular to incentivise operating partners over sale and lease-back. Own and operate approaches often seek scale however acquisition of multiple farmland assets for aggregation is complicated when foreign investors are involved. The FIRB public advertising requirements mean that land values are quickly inflated – destroying the value creation potential modelled by investors. On this basis, acquiring assets needs to be about identifying alternative and higher value use, rather than scaling what is already there. It is difficult for real asset funds to compete with neighbouring properties, which can quickly leverage existing local labour, equipment and supply chains.

Private equity (operating strategy)

Asset managers focused on private equity strategies are seeking productivity improvements, matched with enterprise needs for private and a long-term view on capital. Investing in change of land use on a farm is a common approach to value creation for private equity funds. There are many notable examples of activity along the Murrumbidgee, where farming has been transformed from rice to higher yielding cotton. The Gundaline transactions made headlines in recent years with a $75 million exit that followed an initial reported $25 million acquisition with an application of $15 million in capital to scale up the operation. This represents the type of private equity transaction that can build confidence within the agribusiness investment community.

Private equity funds can take a traditional view of agriculture, centred on the opportunity to achieve 15-20% returns in relatively short timeframe through aggregation and investment in processes, achieving economies of scale and injective large quantities of investment capital. Few family farming enterprises would have the ability to undertake large scale transformations, such as moving from cattle to perennial tree crops, due to capital constraints being beyond the balance sheet capacity of most smaller farming enterprises.

Water is often the limiting factor and more sophisticated private equity approaches will invest in productivity gains, such as through crop selection and finding the best application of water in the context of the farmland asset. Beyond water, it also takes investment capital to change the farm layout, invest in equipment, and fund working capital across the agricultural cycle (including lags between investment and returns for many crops including perennial tree crops).
Credit / Debt

Agricultural debt can offer investors access to the sector without the managerial and regulatory risk of direct ownership. Australia’s diverse geography, climate and production across the sector enables investors exposure to a portfolio of agriculture, fisheries and forestry assets that can be balanced for seasonality and weather risk. Transaction costs can be lower, as fewer foreign investment review regulations, stamp duty and other taxes may apply.

The top 10 global investors pursuing a credit / debt strategy in agriculture represent $38.1 billion of global AUM, however these are not currently focused on Australia. While these investors do not represent the total global investment capital available, clearly there is a lack of awareness of Australian opportunities in parts of the global investment community.

Venture capital (AgTech and FoodTech)

Only three of the global top 25 venture capital investors with a focus on investing in agribusinesses (such as early stage AgTech) have a global geographic mandate, i.e. one that could include Australian investment. These funds are TPG Capital, Pontifax AgTech Fund, and Anterra Capital and together represent a total AUM of USD8.5 billion, or 2.7% of international investment that could be available to Australian agribusinesses.

Operational strategies implemented by private equity investors include moving to higher value products (including value adding), utilising water for higher-value products, achieving economies of scale and scope through owning multiple assets, and focusing on high-growth/high-value products and markets.

Coarse grains and other cereals, oil seeds and sugar can also be utilised to produce bio-fuels. Rising energy prices and the need to reduce greenhouse emissions are creating additional demand for these commodities and demands on agricultural land. Domestic and international investors are recognising a strong thematic opportunity in these areas.

Taking a multi-national view also drives opportunities for some Australian asset managers. Free Trade Agreements give rise to Australian agribusinesses servicing more markets, such as table grapes for export. In this case, returns for water use could be close to $5,000 per megalitre whereas the equivalent application of water to rice will generate around $280 gross margin return (Schache, Ratna & Pollock, 2012; Sunrice, 2016). Furthermore, sophisticated asset managers are working to ‘piggy-back’ off hemisphere cycles to keep the market moving, for example working with Canadian suppliers in the off-season.

A common private equity investment thesis is underpinned by export growth being driven by growth in per capita incomes for higher income cohorts as well as overall population growth. It supports the strategy towards premium Australian branded, traceable, packaged products. Growth in China, in particular, is driving exports of premium products over other international markets. Rising average income and changes in consumer tastes in developing countries are also expected to increase demand for food and fibre.

Credit and debt investments represent an instrument that could be valuable in growing the sector and represents a substantial proportion of global agri-assets under management, however the leading investors focused on this strategy are not currently engaged in the Australian market.

→ Whilst there are active venture capital funds in Australia seeking opportunities in the sector, Australia does not currently appear to be attracting the interest of global investment pools for new AgTech and FoodTech enterprises.
Findings from investor interviews

**Impact investing**

Impact investing refers to investments made into companies, organisations and funds with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return. Over the past decade, impact investing has gained significant momentum with over USD$500 billion in AUM as of 2018. As investment strategy and an approach to addressing social and environmental challenges, impact investments seek to generate both a financial return and positive, measurable social and environmental impact.

There is a continuum of purposeful capital ranging from ESG investments which often seek compliance with specific parameters whilst taking a “do no harm” approach to investment decisions, through to “pure impact” investments that preference impact over financial returns. At this latter end of the purposeful capital spectrum investors still expect to preserve capital, which is a key distinction over philanthropic or granting approaches.

Overall, while impact investing is growing, none of the leading global investors with strategies in impact investment and representing AUM of USD$10.8 billion are currently looking at opportunities in Australia. This could be due to the size of the Australian market, or the sheer number of alternative opportunities presented in the US and EU. Asset managers operating in Australia have identified the importance of investments that demonstrated sustainability, but the measures of sustainability are still emergent and vary across the sector with operators promoting sustainable practices to investors, from regenerative agriculture to bio-dynamic agriculture. Several investors interviewed expressed that they have avoided Organic Agriculture because, while good, “it simply did not scale well”.

Funds with a marginal focus on sustainability, ESG or impact are generally less successful at influencing shifts in farming practices than dedicated purpose-led investment teams. For example, one private equity fund is targeting sustainable agriculture equity investments, originating deals with small and middle-market agribusiness companies in the United States. However, the fund’s focus on sustainability is entirely driven by the need to meet requirements of a key superannuation investor in the fund and this investment direction has not translated into the fund’s Australian operation.

Impact investment can represent a wide spectrum of investments made across a continuum of purposeful capital. At one end of the spectrum ESG investment is largely focused on compliance with specific regulations or parameters and takes a “do no harm” approach to investment decisions. At the other end of the spectrum, investment decisions are made on generating impact first and preserving capital.

Carbon sequestration has been a commonly targeted sustainability strategy, with organisations such as Green Collar operating projects of interest to investors in the Agriculture sector across Australia. Kilter Rural is an Australian fund that is focused on regenerating Australia’s landscapes. Kilter operates three funds and one mandate with $500 million AUM. The fund targets irrigation zones, reducing use of pesticides and producing organic crops. Ecosystem services is a key feature of the Kilter Rural strategy. The operating model involves taking 30-50% of landscapes out of production, with a focus on using the capacity for biodiversity and carbon sequestration.

Investigate the development of common and efficient metrics for investment in agriculture, fisheries and forestry assets to inform the needs of ESG investors.
Enterprise operating models

Operating scale is a key consideration for investors however the investment market is divided. Some asset managers take the view that scale is key to driving farm performance, whereas other managers seek to target farm operators that focus on business management. Aggregator investors such as Proterra seek to acquire multiple properties to create value. For example, Proterra acquired 47 separate farms over a period to achieve the scale of investment required to deliver their investment thesis. Value is also sought in larger-scale family farming operations that have professional farm management systems, but that do not have the corporate overhead of a listed operator.

There is a focus on declining productivity in broadacre agriculture in Australia and some asset managers hold the view that more and better land needs to be brought into production while allowing existing land in production to be transitioned into producing more profitable commodities. For example, Proterra has successfully transitioned farmland assets from grazing beef cattle into sugarcane production near Mackay in Central Queensland.

Other asset managers focus on identifying premium pricing and building bespoke supply chains. EAT Group is an example of a niche product and premium price business that blends a private equity fund with direct investment.

The fund has been structured to enable smaller investors at for example $100,000 investments to participate in Plant Based Protein markets, while larger foreign investors have taken direct balance sheet positions in specific companies under the group. The EAT Group identifies supply chain investment opportunities then undertakes Series A and B capital raising, builds the operations team and sources series C to expand.

In many cases partnering and sharing risk and reward with operators is a central component to the operating model. Asset managers with both domestic and international financial backing have identified that partnering with established, successful, local farmers has been key to their success. The model for partnership varies by fund. One approach commonly engaged in is for the fund to secure offtake either domestically or internationally and work back down the supply chain with local operating partners to deliver. Creation of the King Island Beef cooperative is one such example with an investment in a red meat processing plant on King Island, working with premium off-takers and back into local farmers to establish supply, sharing equity in the model with suppliers and establishing a share of the royalties in branding. Offering suppliers carry in the fund is an approach taken by funds that seek to own the assets but want to enable family farms to retain some equity risk and upside.

→ Enterprise operational models for assets owned by third-party investors often vary, but typically seek to establish economies of scale and scope.
Capital requirements of Australia’s agriculture, fisheries and forestry sector

Final Report

By NCEconomics
30 November 2020