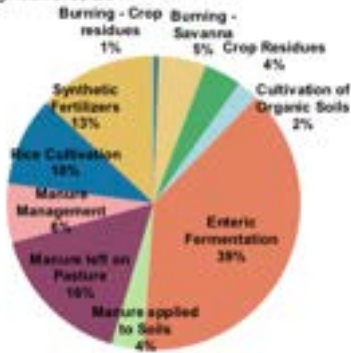


THE FUTURE OF FOOD AND THE INSPIRE AUSTRALIAN EQUITIES INVESTMENT IN WIDE OPEN AGRICULTURE

THE CHALLENGES

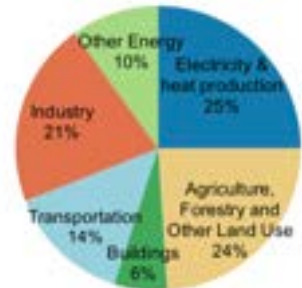
The complex global Agri-Food System needs to transform in order to produce 50% more food, eliminate malnutrition for 2.5 billion people and cut ~13Gt of greenhouse gas emissions by 2050. The food system accounts for 26% of global GHG emissions (Source: Quorn) and this is expected to grow by 16% over the next 30 years, driven by increasing population (from 7.8 billion to 10+ billion by 2050) and increased consumption per capita.

Emissions from Agriculture, 2017



Source: UN Food & Agriculture Organization, Morgan Stanley Research

Global GHG emissions by Economic Sector, 2014



Source: UN Food & Agriculture Organization, Morgan Stanley Research

The Agriculture sector is the largest contributor to biodiversity loss primarily through land clearing for human and pet food 0.8-1.2% of agricultural land (approx. the size of the UK). Livestock occupied 3.28 billion hectares of land (67%) and does not include the 25% of crop production for livestock feed. Agriculture is also a major user of potable water. Lands and soils around the world have gradually been degraded over the years and climate change is exposing and exacerbating this trend. Soil health in most parts of the world are at all time lows.

Food loss and waste are also significant problems with approximately 30% of all food produce not being consumed from 'farm to fork'. Furthermore, greenhouse gases from food waste are material, being the third largest contributor behind the contributions from the USA and China.

There are solutions to the food challenges, but compromises are likely to have to be made as none of them can solve all the problems of providing i) sufficient, ii) low carbon, iii) healthy and (iv) sustainable food for the 10 billion people who will inhabit the planet in 2050. The problems facing the global food system are not new, but with a renewed focus on this area among policymakers, 2021 is looking as a potentially pivotal moment. The EU has already announced its Farm to Fork strategy, with more detailed proposals to emerge over the next four years, including mandatory front-of-pack nutrition labelling, targets for food waste reduction, initiatives to stimulate reformulation of processed food, a requirement for the food industry to integrate sustainability into corporate strategies, EU carbon farming initiative, and the reduction of the use of pesticides and fertilisers.

Outside Europe, policies from President Biden include investment in precision agriculture, while China's President Xi has outlined a vision for green development, which is expected to include agriculture. Next year, the UN's Food Systems Summit aims to "launch bold new actions to transform the way the world produces and consumes food". This has the potential to mobilise both the public and private sector in the same way that COP26 did for climate change.

In May 2021, we will see the the CBD COP 15 (UN Biodiversity Conference) in Kuming in China, and in November we will see the COP26 on Climate Change conference in Glasgow, Scotland – two major events that will have agriculture and food at their core.

Sector	Annual emissions (Mt CO ₂ e)		Change (%)
	Year to March 2015	Year to March 2019	
Energy – Electricity	182.4	178.9	-2.1
Energy – Stationary energy excluding electricity	98.7	103.8	5.1
Energy – Transport	99.9	101.2	1.3
Energy – Fugitive emissions	56.3	59.8	5.9
Industrial processes and product use	34.1	34.6	1.3
Agriculture	72.0	68.6	-4.8
Waste	12.0	12.1	0.6
Land Use, Land Use Change and Forestry	-19.6	-19.4	1.2
National Inventory Total	525.8	528.9	0.6

Source: Australian Government, Dept. of the Environment and Energy - Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019.

In Australia, agriculture contributes 3% (about \$50 billion) to GDP or 12% (about \$150 billion) if value adding processes are included. Agriculture, forestry and fisheries bring in around \$40 billion in export income (around 13% of total export income). Agriculture however also contributes 12.7% of total GHGs, and includes methane and nitrous oxide emissions from enteric fermentation and manure management in livestock these emissions.

Since European settlement, 44% of Australian forests and woodlands have been cleared largely for agriculture. Land clearing and habitat loss are the biggest drivers of animal extinction and in recent years, Australia's aggressive rate of land clearing has ranked among the developed world's fastest. Australia has one of the highest rates of animal extinction in the world, having driven 29 mammals to extinction since European colonisation, with more than 1,700 others now threatened or endangered.

INNOVATION AND INVESTMENT IN SUSTAINABLE FOOD SYSTEMS

Climate directly impacts emissions from the agricultural sector. Drought conditions have led to poor grazing conditions and the high cost of grain. The lack of feed available has led to reductions in both sheep and cattle levels. During 2018-19, drought conditions impacted crop yields throughout Australia as planting decisions are primarily driven by water availability and market demand. Drier than average seasonal conditions during the planting window and reduced supplies of irrigation water have reduced the cotton harvest by almost 50%. In NSW the area of rice planted declined by close to 90% in 2018-19.

Decarbonising the agriculture sector and carbon farming

Sequestering carbon into soils has significant potential for reducing Australia's GHG total emissions, however carbon farming has been plagued by a lack of scaled projects and measurement and accountability problems. The Government has now identified soil carbon as one of the 5 areas for its 2019 Technology Investment Roadmap.

While there is an underlying shift towards demand for healthier food, packaged food is still growing by ~3% per year. As such suppliers of food and beverages (producers and retailers) have a vital role to play in transforming the agri-food system. The benefits of naturally healthy food are not disputed, but cost is preventing consumers from eating healthier diets. 86% of consumers across US, UK and China believe that they could eat/drink more healthily. Cost was the main reason given for not eating more healthily (42%), followed by it being hard to change current habits (32%) (Morgan Stanley).

Leading food companies are looking to reduce their scope 1, 2 and 3 carbon emissions. The majority of emissions from the food and beverage sector are scope 3 emissions, occurring through the value chain. As such, it is critical that any carbon reduction targets also encompass scope 3 through initiatives such as regenerative agriculture practices and elimination of deforestation.

The Clean Energy Finance Corporation has supported the decarbonisation of the Agriculture Sector through funding various initiatives, and in 2019 released a report for the sector identifying many ways farmers could decarbonise their operations.

https://www.cefc.com.au/media/402212/cefc_transform_aust_agriculture_w_clean_energy.pdf



Regenerative farming and other alternatives practices

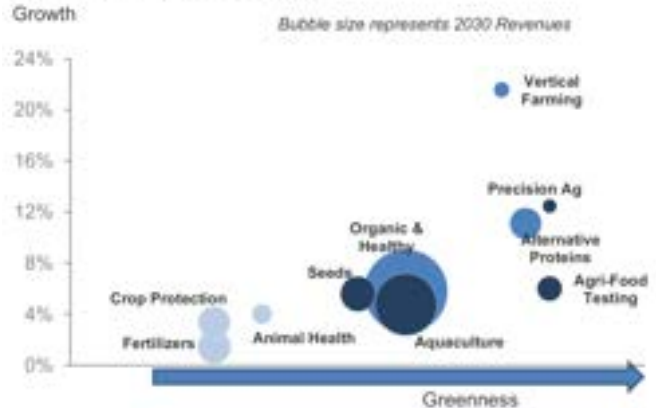
Regenerative farming has developed rapidly in the last five years, with various movements and methodologies including low/no till, managed crop rotation, cover crops, and extending into the areas of organics (no chemicals/pesticides) and permaculture. These farming methods are having benefits for climate change (GHG emissions), biodiversity, productivity, financial returns and climate change resilience. There are now strong and fast growing regenerative farming movements in Australia, the US, across Europe and in parts of Africa.

AgTech Solutions to food

There has been an explosion in innovation in agriculture, and in particular in AgTech, with numerous incubators and accelerators being established in Australia and globally. Set out below are 11 themes that summarise new investment areas in food and agriculture that have emerged.

- Precision agriculture** brings technology and data to farming in order to optimise efficiency and productivity, and reduce the use of fertilisers and crop protection products. It covers a range of different approaches, including satellite data, drones, sensors, automation and robotics.
- Innovation in seeds** has driven the bulk of yield enhancements over the last 30 years on both the conventional and genetically modified (GM) sides. R&D continues, and new projects have significant potential for reducing crop loss and optimising the use of key resources such as nitrogen, land and water. This is a scalable solution that can be used globally.
- Agri-food testing** covers many stages across the agriculture and good supply chain. For example, agricultural and crop analysis and inspection, cargo inspection of raw materials and crops, product ingredient stability testing analysis, labelling regulation conformity and certification, and ongoing quality control testing. Regulation is also accelerating and provides a structural tailwind for the agri-food testing industry.
- Aquaculture** will be key for meeting the growing demand for fish globally, with the majority of marine fisheries either fully or over-fished. Fish is a source of healthy low-fat protein and is far less carbon-intensive to produce than beef. Sustainable practices need to be adopted – for example, limited the use of antibiotics, use of sustainable feed, and preventing the escape of farm-raised fish.
- Vertical farming** is pesticide free and uses less water than traditional farming (95% less for aeroponics and 70% less for hydroponics). Up to 99% less space is needed compared to conventional agriculture methods, with productivity up to 300x higher than a field farmer. However, it is only suitable for high-value crops such as leafy greens and strawberries and thus its scale will be limited.
- Alternative meat** burgers produce up to 90% lower green-house gas emissions than traditional equivalents and use 99% less water. There are some private players, such as Beyond Meat, and many large food companies have also invested in this area. We estimate that achieving ~16% growth per year would result in ~3% of the global meat market coming from these alternatives by 2030.

Key solutions for reorienting the global agri-food industry



Source: International Food Policy Research Institute, Global Agri-Food Outlook 2020-2030

- Organic and naturally healthy food** – the benefits of healthy are clear and in Europe, the US and Australia are focused on increasing organic farming and improving access to healthy, nutritious food. However, globally, there are limits to both areas. Organic farming typically produces lower yields, while cost and convenience can put a cap on the uptake of healthy food.
- Fertilisers** increase yields, thus reducing the need to cultivate new land, which may include deforestation. However, application rates have already plateaued in the US and Europe, with limited upside in other regions too. In addition, there is a regulatory headwind, with the EU aiming to reduce fertiliser consumption by 20% by 2030, and growth is only expected to be 1-2% for nitrogen and ~2% for potash.
- Crop protection products** such as fungicides, herbicides and insecticides improve agricultural yields, thus helping with the need to produce more food for a growing and increasingly wealthy population. However, as with fertilisers, the EU wants to reduce the use of chemical pesticides. Annual growth should be ~3%, but companies that can develop bio-based products should be at a relative advantage.
- Animal health products**, such as vaccines, parasiticides, medicated feed additives, anti-infectives and diagnostics, can help to improve productivity in the livestock industry. However, the use of antibiotics must be done responsibly to reduce the risk of antibiotic resistance in humans and ensure animal welfare.

Market investment opportunities

Given the new themes in agriculture and food, many of the standalone or pure play companies are at the early stage of development and as such, most of the investment opportunities are in private capital markets. A number of agriculture and food conglomerates are however exploring these themes within their broader businesses.

CASE STUDY: IAE FUND INVESTMENT IN WIDE OPEN AGRICULTURE (ASX:WOA) (<https://www.wideopenagriculture.com.au/>)

The Inspire Australian Equities Fund aims to invest in companies that are having a positive impact through the production of clean sustainably produced food, addressing the problems of food shortage, healthy eating, improving biodiversity, sustainable agriculture and reducing GHGs. This is helping directly address SDGs 1, 2, 3 and indirectly address SDGs 11-15.

Wide Open Agriculture (ASX: WOA) is a Regenerative Food & Farming company based in Western Australia – the only listed regenerative farming pure play company in the market.

Purpose

Their purpose is *To build a new food and farming system to make a healthier world.* They are seeking strong, sustainable financial returns and are committed to making a positive, measurable impact on the ecosystems and communities in which they operate.

Regenerative farming and Products

Through their Dirty Clean Food™ brand and new product development of oat milk and lupin protein (<https://www.dirtycleanfood.com.au/>), they create, sell and distribute healthy, nutritious foods and drinks. They partner with farmers committed to rebuilding healthy soil, enhancing biodiversity and restoring the natural water and nutrient cycle. Their supplier program consists of 4 components –

- (i) Commitment to carbon neutrality
- (ii) Production Protocols
- (iii) Regenerative farm plans that align to tiered ranking
- (iv) Farmer Support. See the - Regenerative Supplier brochure https://cdn.shopify.com/s/files/1/1921/6595/files/Potential_Supplier_Brochure_1.2.pdf?v=1598509752

They choose farmers who are committed to regenerative farming to rehabilitate and enhance the entire ecosystem of the land. Their conscious customers support them as they buy food from healthy land that's getting healthier through regenerative practices. They ensure their regenerative farmers believe that if they take care of the soil, it will take care of them. These regenerative practices not only mean healthier plants and animals, but they help fight the climate crisis by pulling carbon from the atmosphere and sequestering it in the ground.

Scaling Impact

WOA is scaling its impact through increasing regenerative land under influence, which has grown significantly over the last three years from 300 ha in 2018 to 3,300 ha in 2019 to 9,259 ha in 2020.

Carbon sequestration and reduction

WOA has identified carbon as their key measure of impact. Carbon is a good proxy measure for ecosystem health. WOA is committed to sequestering carbon through regenerative farming practices to tackle accelerating climate change. Their key practices to sequester carbon and reduce emissions are;

- (i) scale up regenerative farming practices across Western Australia,
- (ii) increase access to plant-based food and drinks,
- (iii) eliminate food waste and
- (iv) reduce emissions in transport and refrigeration.

They have committed to become carbon neutral operationally by 2023. They have registered WOA and the OatUp product as carbon neutral with the Federal Government's Climate Active program which works to get companies to become carbon neutral.



Through their carbon neutral certification for OatUP and WOA corporate activities they have off-set approximately 125 tonnes of CO₂-e in the 2020 reporting period.

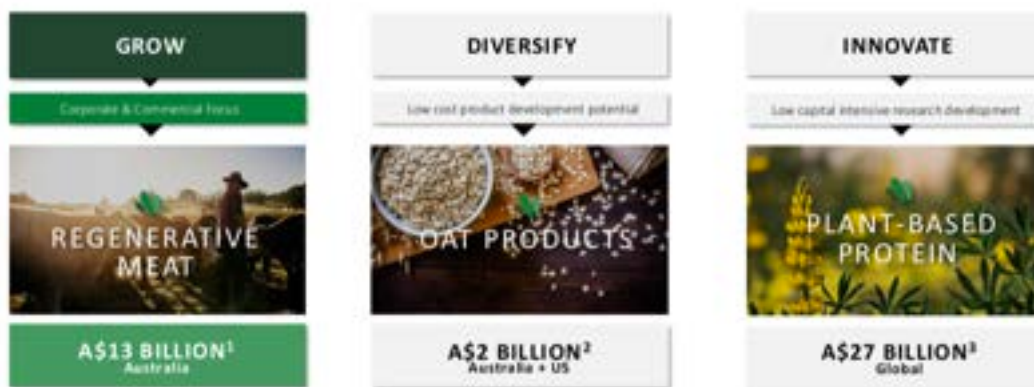
Sustainability milestones

Set out below are key sustainability milestones WOA has achieved over the last five years.

Date	Event/ Milestone
2015	WOA established under the 4 Returns framework (financial, social, natural and inspirational returns) to achieve large-scale landscape restoration. https://www.commonland.com/4-returns/
2018	WOA established 4 Returns into their constitution and was the world's first 4 Returns Company listed publicly on any stock exchange
2015-18	WOA reported impact across the 4 Returns framework but found some indicators to be complex for communication and resource heavy for collation
2019	WOA identified carbon as the best proxy indicator for ecological health that also aligned to the 4 Returns framework
2019	WOA utilised data from the Drawdown Project to identify our top 4 measures to sequester carbon and reduce emissions - (i) reduce food waste, (ii) support plant-rich diets, (iii) large-scale uptake of regenerative farming practices and (iv) transport & refrigerant clean alternatives
2019	WOA Board committed to achieve carbon neutrality through insetting carbon sequestration through their supplier's soil carbon sequestration by 2023 - www.dirtycleanfood.com.au
2020	OatUP and WOA certified carbon neutral by Climate Active - https://www.climateactive.org.au/buy-climate-active/certified-members/oat-original

Strategy

Their commercialisation strategy is as follows:



Their strategic priorities have been:

- Revenue Growth
 - Penetrate new domestic markets - Consolidate and grow local market share in WA and launch into new states across Australia.
 - Expand product offering only - Allow more ethical, regenerative food brands to use DFC as a sales channel to increase product diversity across multiple food categories.
 - Grow & retain customer base - Sales and marketing activity to increase online traffic and build B2B customer base.
 - Export to Asian Markets - Sign supply agreements with South-East Asian food distributors.
- Launch new products and build manufacturing capability
 - Construct and operate a food grade, lupin protein pilot-scale manufacturing facility;
 - Construct and operate >15m litre capacity p.a. oat milk manufacturing facility in Western Australia.
- Become Carbon Neutral - WOA has met requirements of the Climate Active Carbon Neutral Standard for organisations and is now certified as Carbon Neutral.

