

# Accelerating AgTech: Australia's Opportunity in Vietnam

A report by  
Asialink Business  
and Beanstalk



**BEANSTALK**





## About Asialink Business

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Asialink Business was established in 2013 as the National Centre for Asia Capability.

Our founding partners include the Australian Government's Department of Industry, Science, Energy and Resources (DISER), the University of Melbourne and the Myer Foundation.

Our business-focused capability development programs, advisory services, and public events assist organisations to develop essential knowledge of Asian markets, business environments, cultures and political landscapes to engage more effectively with the region.

The organisation brings deep knowledge about doing business in Asia, proven methodologies to unlock opportunities in the region, and an extensive business, government and academic network. This combination uniquely positions Asialink Business to support Australian businesses wishing to maximise their growth opportunities.

To start a conversation about how we can help unlock Asia opportunities for your business, please get in touch.

## About Beanstalk

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Beanstalk is an innovation agency dedicated to unleashing the potential for agriculture to be the leading force for good. We exist to support corporations, start-up innovators, investors, and government bodies across the Asia-Pacific to advance sustainable, ethical, and responsible food systems.

Our core competency is in helping our clients to navigate and adopt leading practices and technologies, with purpose and clarity. Our advantage lies at the intersection of our deep domain expertise, our open innovation mindset, and our regional network.

Our team consists of agriculture, innovation, strategy, and operation experts based out of Melbourne, Sydney, Perth, and Singapore.

Learn more at [www.beanstalkagtech.com](http://www.beanstalkagtech.com)

## Acknowledgement

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# Executive summary

Vietnam's agriculture sector is at an inflection point that presents significant potential for Australian AgTech businesses.

Vietnamese producers and businesses across the agrifood supply chain are retooling and transforming to accelerate industry growth, maintain export competitiveness, and ensure long-term sustainability.

Technology is a key component of this story. AgTech innovation is increasingly embedded into the operations and interactions of agriculture enterprises of all sizes in Vietnam, from smallholder farms to multinational corporations. There are opportunities for Australian AgTech businesses across the breadth of Vietnam's agriculture sector. Among these, we have identified four particularly prospective areas for Australian businesses:

1. **Sustainability:** Demand will grow in Vietnam for technology innovations that avoid wasting inputs and mitigate environmental impacts, such as sensors coupled with data analytics that can help decision-making.
2. **Climate resilience:** Both countries are grappling with the impacts of climate change, creating opportunities in areas such water management and weather-related risk assessment.
3. **Productivity:** As Vietnam is export-oriented, there are opportunities for technologies that will boost productivity in the face of seasonal variations, such as robotics, automation and drones.
4. **Food quality and safety:** Growing concern among Vietnamese consumers about food safety is creating opportunities in blockchain, QR codes and DNA tracing to give visibility over food production and supply chains.

The AgTech ecosystem in Australia is flourishing, and a strong foundation of bilateral partnership with Vietnam is already in place. Australian AgTech innovators can leverage the strength of Australia's ecosystem to provide a set of solutions and expertise that can address these areas.

Capitalising on this opportunity will require Australian businesses to invest time and resources developing better market understanding and practices. They will need to adapt their products to local requirements, identify appropriate entry points, and engage partners to support them in-market. We have developed a roadmap of practical steps to help position Australian AgTech businesses for success in Vietnam.

The Australian and Vietnamese Governments can contribute to success by identifying AgTech as a priority area under the forthcoming Vietnam Enhanced Economic Engagement Strategy, along with supporting initiatives. In the near term, this could include expanding existing grant mechanisms through multi-year programs and support for pilot programs will address critical market failures. Longer-term, the Governments should enhance efforts to reduce non-tariff barriers and improve the information available to AgTech businesses.

If Governments and the private sector act quickly to coordinate their efforts, they can capitalise on pressing opportunities, accelerate growth and realise the potential of both Australia and Vietnam's AgTech sectors.

# Overview



# Overview

## Key points

- Agriculture is critical to the Vietnamese economy, and strengthening the sector is a key focus for the Vietnamese Government.
- AgTech has the potential to drive future growth in the sector, and is being recognised by both public and private sector investment and activity.
- To succeed in Vietnam, Australian AgTech businesses need to tailor their solutions to fit within its diverse, smallholder-driven, fragmented and export-oriented sector.

## Vietnam's agriculture sector is at an inflection point

Agriculture is critical to the Vietnamese economy. In 2020 agriculture was Vietnam's third largest sector,<sup>1</sup> accounting for 15 per cent of GDP, generating \$56.3 billion in exports and employing 30 per cent of Vietnam's workforce.<sup>2</sup>

But the Vietnamese Government has made it clear that the sector's unsustainable use of natural resources and slow technology adoption is impacting productivity and limiting its potential.<sup>3</sup> Businesses across the agricultural supply chain are facing pressure to upgrade their practices to remain competitive in international markets, protect livelihoods and ensure sustainable growth.

Agricultural technology (AgTech) has the potential to transform the sector. AgTech refers to technology solutions that can be applied across the supply chain to improve food production through increasing yield efficiency, productivity or the sustainable use of resources (see **Figure 1 | AgTech Value Chain Map on page 06**).<sup>4</sup> This report focuses on upstream technologies used on the farm and midstream technologies that address consumer demands for transparency, traceability and safe food.<sup>5</sup> Downstream technologies, targeting the consumer end of the supply chain are not included in this analysis.

Vietnam's challenges present opportunities for Australian AgTech businesses. Australia is globally recognised for its agricultural research and capabilities in AgTech-related sectors such as genetics and data analytics, which underpin productivity and export competitiveness.<sup>6</sup> Australia has high rates of agricultural productivity, and has developed a global reputation as a producer of safe, green and quality agricultural produce.<sup>7</sup> Australia is a top five global exporter by value of beef, lentils, sugar, wool and wine and the tenth largest exporter of cereals.<sup>8</sup> Australia also faces many of the same environmental risks that threaten Vietnam, such as climate variability, droughts and water scarcity. Among other opportunities, Australian AgTech companies can apply their expertise in dealing with environmental risks and increasing productivity in difficult weather conditions, to the Vietnamese context.

Figure 1 | AgTech Value Chain Map

# AGTECH VALUE CHAIN MAP

## UPSTREAM

### Biotechnology

On-farm inputs for crops and animals including genetic modification, microbiome and inputs for breeding and animal health help increase productivity and sustainability.

**EXEMPLARY INNOVATORS**  
AgBiTech, Terragen, ProAgni

## UPSTREAM

### Water management

Real-time IoT water monitoring and nutrient monitoring platforms help producers manage on-farm irrigation and water use.

**EXEMPLARY INNOVATORS**  
Farmbot, Swan Systems, Mait Industries

## UPSTREAM

### Novel farming systems

Vertical farms, aquaculture, insect and algae production are novel farming systems that increase land and labour efficiency and automate input use.

**EXEMPLARY INNOVATORS**  
Orlar, InvertiGro, Lleaf

## UPSTREAM

### Whole farm management

Farm management platforms help producers manage their overall farm business and operations.

**EXEMPLARY INNOVATORS**  
AgriWebb, Agworld, Ambit Robotics

## UPSTREAM

### Automation

Robotic farming equipment and drones automate farming operations (e.g. feeding, animal sorting, harvesting), reducing human error and labour costs.

**EXEMPLARY INNOVATORS**  
SwarmFarm, thingc Robotics, Agerris

## UPSTREAM

### Data analysis/ storage collection

Data capturing devices connect crops, livestock and machinery with sensors to capture data and generate prescriptions to help producers make decisions.

**EXEMPLARY INNOVATORS**  
Regrow, DataFarming, The Yield





**UPSTREAM**  
**Soil/ fertiliser management**

Genomics, artificial intelligence and other technologies help test and map soil microbiome and provide prescriptions on input use, to improve soil health and increase yield.

**EXEMPLARY INNOVATORS**

Laconik, Thinkbio, Soil Carbon Co

**UPSTREAM**  
**Livestock management**

Livestock management technology can help manage animal movement, protect animal welfare and reduce environmental impacts through improved inputs and monitoring.

**EXEMPLARY INNOVATORS**

FutureFeed, MaiaGrazing, Smart Paddock

**UPSTREAM**  
**Pest/disease management**

Biometric sensors and artificial intelligence technology can provide early pest and disease detection.

**EXEMPLARY INNOVATORS**

MALDI-ID, Nexgen Plants, RapidAIM

**UPSTREAM**  
**Waste management**

Waste management solutions help reduce waste from agriculture production.

**EXEMPLARY INNOVATORS**

Goterra, Viridian Renewable Technology, Future Green Solutions

**MIDSTREAM**  
**Primary processing**

Processing technology automates or optimises agriculture processing steps.

**EXEMPLARY INNOVATORS**

Natural Evolution, LYRO Robotics, Whole Green Foods

**MIDSTREAM**  
**Supply chain technology**

Track-and-track, sensor and blockchain enabled technologies help to improve transparency, provenance, market access, compliance and logistics optimisation.

**EXEMPLARY INNOVATORS**

AgriDigital, AgUnity, Orijin+

**MIDSTREAM**  
**Financial/ economic management**

Fintech provides financial services for different stakeholders along the supply chain enabling them to conduct business transparently and in a trusted environment.

**EXEMPLARY INNOVATORS**

Hillridge, Agrimaster, AuctionPlus

**MIDSTREAM**  
**Food safety technology**

Food safety technology including food testing tools, food freshness sensors and shelf-life enhancement technology helps to increase product quality and longevity

**EXEMPLARY INNOVATORS**

PPB Technology (CYBERTONGUE)

# A snapshot of Vietnam's agriculture sector

Vietnam's agriculture sector – which produces and processes crops, livestock, and aquatic species – is characterised by being diverse, smallholder-driven, fragmented and export-oriented. Each of these factors impact the approaches Australian businesses can take to access the market.

## Diverse

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Vietnam's unique geography of mountains, forests, coasts, deltas and river networks support the production of a variety of crops and significant livestock, fisheries and aquaculture sectors.

Vietnam cultivates more than 800 distinct agricultural plant species.<sup>9</sup> This includes a wide range of crops such as rice, vegetables, coffee, rubber, pepper, cassava, fruit, cashew nuts and tea.<sup>10</sup> The main livestock species raised are cattle, buffaloes, pigs, poultry and goats.<sup>11</sup> The livestock sector is growing as meat consumption increases, but its potential is constrained by the limited and fragmented available land and reliance on imported feeds. In 2020, pork and poultry comprised the majority of meat sales, followed by beef.<sup>12</sup> Vietnam is also the world's fifth largest fish producer and fourth largest aquaculture producer.<sup>13</sup> Giant tiger prawn culture and pangasius (catfish) are the two main aquaculture products in Vietnam.<sup>14</sup>

Rice is a major contributor to Vietnam's agriculture sector. It was Vietnam's largest agricultural commodity by value in 2019, and used 94 per cent of available land for its production.<sup>15</sup> However Vietnam's next largest agricultural commodities – pork, fresh vegetables, coffee and poultry – are comparable in terms of combined value (see **Figure 2 | Top 10 agricultural commodities in Vietnam on page 09**).<sup>16</sup> Businesses seeking export opportunities in Vietnam should note that the top 10 commodities have different farm production systems, value chains and different pressure points.

Vietnam's agriculture sector is made up of many sub-markets, each characterised by unique challenges and opportunities. There is no single entryway or silver bullet for Australian AgTech businesses looking to enter this diverse sector.

## Smallholder driven

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Small-scale farms (those under 2 hectares) comprise 70 per cent of Vietnam's agriculture sector. Vietnam has some of the smallest farms globally, averaging 0.4 hectares.<sup>17</sup> In comparison, the average size of an Australian farm in 2015 was 4331 hectares.<sup>18</sup> Whilst recent reforms have reduced the number of plots per household from 4.27 in 2004 to 2.83 in 2014, there remains a high degree of land fragmentation.<sup>19</sup>

Smallholders face several unique operational challenges. Most mechanised farming equipment, for example, is not built for use on smallholder farms. Lack of access to capital, markets and information on new agricultural practices and technologies also constrains productivity and smallholders' income potential.

Businesses entering the Vietnam market need to tailor their offerings to meet the unique needs and settings of a smallholder farm-driven agricultural system.



Top 10 commodities in Vietnam by gross production value (constant 2014-2016 I\$)

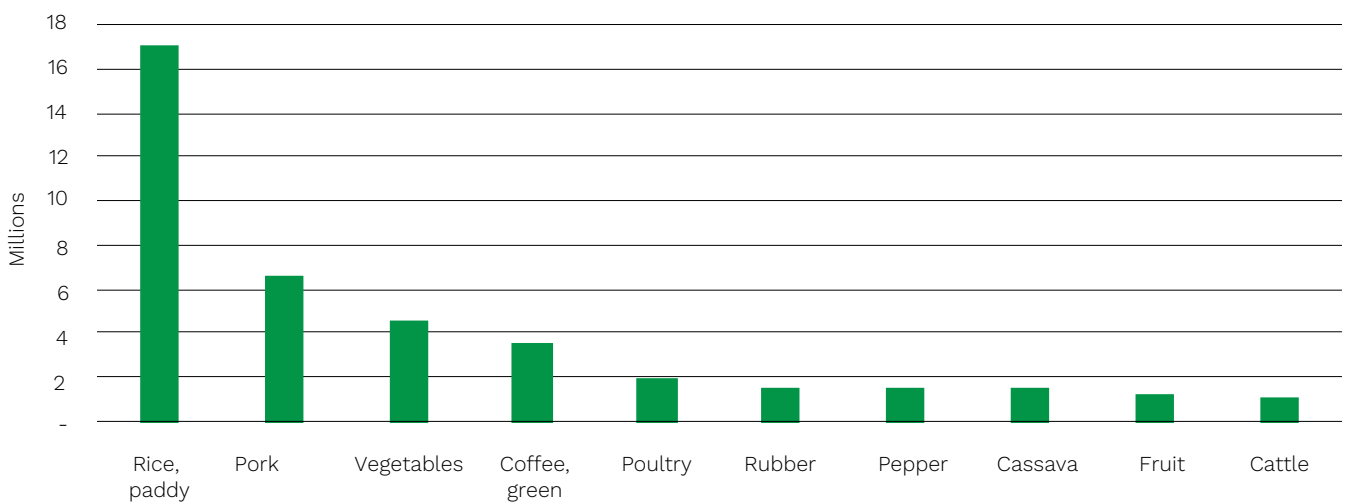


Figure 2 | Top 10 agricultural commodities in Vietnam

Vietnamese start-up Mimosatek designed an irrigation and fertiliser management Internet of Things (IoT) platform to reduce the total water volume and greenhouse gas emissions expended by smallholder rice farmers.<sup>20</sup> This technology uses sensors to measure water levels in rice fields and stores this data in cloud-based software. The farmer can access the water level data in real time via a mobile app, follow the app’s recommendations for timing and amount of water to apply, and adjust water levels accordingly. This reduces water use and emissions significantly.

A critical component of Mimosatek’s offering is the ‘pay-as-you-go’ revenue model. This is an example of not only fitting the ‘product’, but the ‘business model’ to a smallholder environment that is quite capital constrained.





## Highly fragmented with many players

Vietnam's agriculture supply chains are complex (see **Figure 3 | Overview of Vietnam's agriculture supply chain on page 11**). In addition to multiple stakeholders that exist across the supply chain - from fertiliser and seedling businesses, smallholder farmers and farming cooperatives, distributors, processors, retailers and exporters - there are many local traders connecting these stakeholders between each stage of the supply chain. Despite the important service these middlemen provide, their presence lengthens local supply chains, reduces transparency and creates inefficiencies.<sup>21</sup> Poor knowledge sharing between stakeholders leads to patchy compliance with environmental protection regulations and reduces income margins for producers.

AgTech can help to address the challenges created by long and decentralised supply chains. Solutions which improve coordination, information flow, and product safety and quality will result in greater efficiency and profit. It is critical that incoming AgTech innovators consider not only the opportunity, but the challenge of navigating and engaging the required range of actors across this fragmented ecosystem.

Australian AgTech businesses need to spend time understanding this complex supply chain to identify and effectively engage the right partners and customers. The high degree of fragmentation means that AgTech entrants will likely need to manage relationships with a broad range of stakeholders. Lack of supply chain transparency and product traceability will present a challenge for many and an opportunity for some AgTech businesses. Given the length of supply chains, extra consideration also needs to be given to storage, warehousing, and product shelf-life constraints in Vietnam.

## Export-oriented

Vietnam is the world's sixteenth largest global agriculture exporter.<sup>22</sup> In 2020, agricultural exports reached \$56.3 billion, up 2.5 per cent from 2019.<sup>23</sup> Vietnam is a top exporter of rice, coffee, pepper, tea, cashews, rubber, cassava and seafood, producing 50 per cent of the world's pangasius (catfish) and exporting 90 per cent of that production.<sup>24</sup> In 2020, seafood was Vietnam's largest value export worth \$11.5 billion, followed by fruit and vegetables (\$4.49 billion), cashew nuts (\$4.43 billion) and rice (\$4.3 billion).<sup>25</sup> The United States, China, ASEAN and the EU are Vietnam's largest export markets.<sup>26</sup>

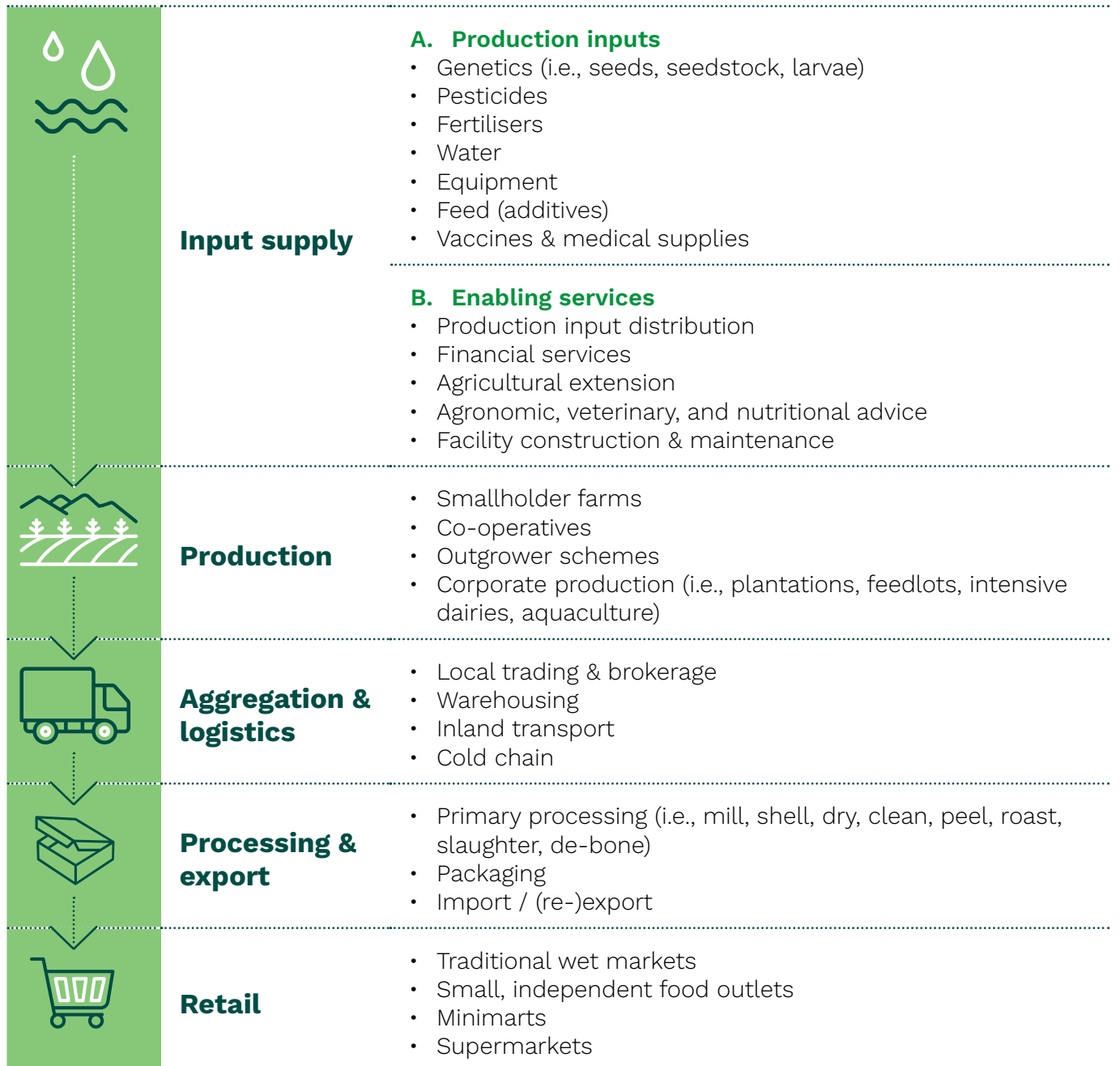
Current Vietnamese Government policy priorities emphasise the importance of growing both the volume and value of agricultural products.<sup>27</sup> The Vietnamese government is focused on enabling value-addition across food supply chains, as several of Vietnam's principal export products are currently exported on low-value commodity markets.<sup>28</sup> In 2020, 18 new factories for agriculture product processing were established.<sup>29</sup>

There are opportunities for AgTech companies who can help producers and processors add value by improving product quality, provenance and processing capabilities. Building the 'Brand Vietnam' story will benefit all producers. This might start with encouraging producers to apply Vietnamese Good Agricultural Practices (VietGAP) standards.<sup>30</sup> Individual food companies can also launch branded value-added products.

As wages grow and Vietnam's agricultural labour force shrinks, Vietnam's competitive advantage in producing and exporting low-value commodities will become more difficult to maintain. AgTech will play a key role in maintaining Vietnam's export competitiveness by boosting the sector's productivity and the value of agrifood exports.



**Figure 3 | Overview of Vietnam’s agriculture supply chain**



# The Vietnamese Government is embracing AgTech as an engine for growth

The Vietnamese Government has set out a vision to build a competitive, highly productive, large-scale agricultural sector powered by digitisation.<sup>31</sup> The Vietnamese Government is focused on supporting large-scale digital transformation in the sector. This entails re-examining the entire supply chain, focusing on each player's role and each link.

AgTech solutions, supported by digital transformation, will be critical to narrow the gap between rural and urban areas, and truly reshape Vietnam's agriculture sector. A 2020 Master Plan encourages the involvement and investment of the private sector in the sector's development.<sup>32</sup> Sustainable agriculture and supply chain development are also key priorities.<sup>33</sup> The Vietnamese Government is also considering new incentives to provide loans and low interest rates to foreign and local businesses investing in agriculture and rural areas.

AgTech businesses should ensure they do due diligence to understand incentives and opportunities that will support their market entry in a fast-changing environment. They can expect the enabling environment for AgTech in Vietnam to strengthen as the government continues to invest in this sector.



# Investor interest is growing off a low base

Historically, startup investment in Southeast Asia has been dominated by retail, FinTech and EdTech sectors. But investor interest in AgTech is noticeably growing. In 2019, \$581 million was channeled into Southeast Asian AgTech startups across 99 deals. The majority of these investments were in downstream areas that are close to consumers, such as in-store restaurant and retail tech (37 per cent of total investment dollars), online restaurants and meal kits (20 per cent) and eGrocery (12 per cent).<sup>34</sup> In Vietnam, AgTech investments totaled \$39 million in 2019, putting it in fourth place behind neighbouring Singapore, Indonesia and Malaysia.<sup>35</sup> The largest AgTech deal in Vietnam to date has been equity investment in Telio.vn. This online B2B marketplace that connects 'mom-and-pop' stores with wholesalers, such as restaurants and grocery retailers, raised \$34.5 million in 2019.<sup>36</sup>

There are early indications that commercial focus is shifting upstream. Upstream categories that saw the greatest investor interest were farm management, sensing and IoT. Although these categories only accounted for 7 per cent of overall investment in 2019, the pipeline of market-ready start-ups, and growing rural digital infrastructure suggests there may be further untapped opportunities for investors upstream.<sup>37</sup>

Competition is heating up locally and regionally, investors are betting big on the viability of AgTech businesses in the region.

## Successful Vietnamese AgTech companies are gaining traction:

- Foodmap (formerly Demeter) provides an IoT based system, which replaces human labour with automation to help farmers manage farms, maintain productivity and product quality. Their solution consists of hardware and cloud-based data analytics. The hardware can control pumps and irrigation systems, micro-climate systems, weather stations, drones and sensors. The data collected is stored in the cloud and turned into useful insights to aid in farmers' decision making.
- Tép Bạc, a leading media platform for shrimp farming and aquaculture systems, has ventured into AgTech by developing an integrated and IP-enabled IoT solution to improve operational efficiency, water quality control, and traceability in aquaculture enterprises.
- CricketOne farms crickets to use as a sustainable ingredient in developing food, beverage and cosmetic products. They process over 22 million crickets monthly to supply to food producers. Their facility attained the Hazard Analysis and Critical Control Points (HACCP) certification, and their products comply with strict US and EU standards and requirements.

# Challenges for Vietnam's agriculture sector



# Challenges for Vietnam's agriculture sector

## Key points

- Vietnam's agriculture sector faces three major challenges: low productivity, poor supply chain integrity and environmental pressures. These challenges threaten the sector's ability to maintain and strengthen its production of high-quality, value-added agricultural products.
- Opportunities exist for AgTech companies that can offer tailored solutions to these challenges.

Vietnam's agriculture sector faces three main challenges: environmental pressures, low productivity and poor supply chain integrity. Understanding these challenges can help Australian businesses identify areas where there is demand for AgTech solutions in Vietnam.

## Environmental pressures threaten agriculture outputs

Increasing the sustainability of Vietnam's agriculture production is vital to protect resources, livelihoods, sector growth and increase product quality. The sector faces considerable environmental threats, including dam construction, salinity intrusion and unsustainable agriculture practices.

- **Dam construction:** Construction of hydro-power dams upstream of the Mekong Delta limits the flow of water, nutrients, sediment and wildlife to the delta. This impacts farmers who rely on these resources for irrigation, soil fertility, livestock feed and replenishing fish stocks.<sup>38</sup> As of 2021, 13 dams exist along the Mekong's main river.<sup>39</sup> These dams are damaging ecosystems and reducing agricultural outputs. Reduced freshwater is also exacerbating the issue of salinity intrusion in the Delta.<sup>40</sup>
- **Salinity intrusion:** Salinity intrusion has intensified since 2019 due to more frequent droughts during the dry season.<sup>41</sup> It reduces water and soil quality, jeopardising crop, livestock and aquaculture production.<sup>42</sup> Farmers are being urged to either avoid planting to prevent crop losses or to grow crop varieties that can withstand the increased salinity.<sup>43</sup> Low-saline water shrimp farmers are also adapting to this threat by raising pond dikes.<sup>44</sup>
- **Unsustainable agricultural practices:** Current agriculture practices are affecting Vietnam's environment and impacting product quality.<sup>45</sup> Water pollution, over-extraction of groundwater, soil contamination, deforestation and greenhouse gas emissions are just some of the environmental costs of unsustainable production.<sup>46</sup> Heavy use of pesticides on crops, and hormones and drugs in meat and aquaculture production also affects the quality and safety of agricultural products. Pesticide use has grown tenfold between 1990 and 2015, with producers using 100,000 tons of pesticide a year in 2015 compared with 10,000 tons in 1990.<sup>47</sup> Few farms apply recognised food production standards such as the Global Good Agricultural Practices or VietGAP.<sup>48</sup> This prevents market access and reduces Vietnam's export competitiveness. Already, China is tightening imports of Vietnamese agriculture products due to concerns about product quality and food traceability.<sup>49</sup>

### Examples of unsustainable agriculture practices needing improvement:

- **Aquaculture:** An estimated 50 per cent of Vietnam's mangrove forests, which protect against storm surges and coastal erosion, have been cleared to build shrimp ponds.<sup>50</sup>
- **Fisheries:** Overfishing causes biodiversity loss and damage to marine ecosystems.<sup>51</sup>
- **Livestock:** An estimated 36 per cent of animal feces waste is dumped untreated into the environment, generating water and air pollution.<sup>52</sup> Livestock production is also Vietnam's second largest contributor of greenhouse gas emissions.
- **Crops:** Widespread use of agrochemicals causes soil degradation, air and water pollution during run-off. Burning residues and wastes discharge further greenhouse gas emissions.<sup>53</sup>

## Climate change

All of these environmental pressures are exacerbated by climate change, which has the potential to reduce Vietnam's GDP by up to 2.4 per cent by 2050.<sup>54</sup> The World Bank estimates that 60 per cent of Vietnam's land and 70 per cent of its population are at risk of climate-related natural disasters such as typhoons, floods, drought and landslides and forest fires.<sup>55</sup> These disasters, combined with shifts in rainfall patterns and rising sea levels will reduce crop yields.<sup>56</sup> Higher temperatures will affect fish stocks as species migrate north to cooler temperatures and away from warm coastline currents.<sup>57</sup> Even transport infrastructure is threatened by more extreme weather, which can disrupt delivery of produce from farms to retailers and to ports and airports for export.<sup>58</sup>

Better adoption of sustainable agricultural practices will be vital to limit the sector's contribution to climate change and increase product quality and export competitiveness. Technology can help farmers increase their outputs whilst improving resource efficiency and building climate change resilience. Government and industry associations can support this change by increasing incentives and education for farmers on sustainable agricultural practices and technologies.

### Impact of climate change on key agriculture products:

- **Rice:** Shifts in rainfall patterns, causing both floods and droughts and increased salinity in the soil and groundwater, are spoiling harvests.<sup>59</sup>
- **Coffee:** Forecasts suggest that 50 per cent of coffee producing areas may become unsuitable for production by 2050 due to rising temperature and changes in rainfall.<sup>60</sup>
- **Pigs:** Increased numbers of hot days can be fatal to pigs raised in high density environments.<sup>61</sup>
- **Cattle:** Longer drought duration or cold temperatures can negatively impact green feed availability for cattle and cost producers more.<sup>62</sup>
- **Aquaculture:** Shrimp production along the coast is subject to more intense storms, rising temperatures and salinity intrusion.<sup>63</sup>

## CASE STUDY: ORLAR

Orlar began in 2014 with a mission to make clean, green, quality food accessible to everyone. This mission that has seen Orlar through the ups and downs of launching in a new country, Vietnam. Using Australian organic certified rock, Orlar have developed vertical farms that emit zero greenhouse gases, produce food that contains zero residues, and make great tasting and long lasting products in Vietnam.

Co-founder Dr. Lyndal Hugo shared a couple of lessons from Orlar's seven years operating in Vietnam:

### *Invest more time than you think in learning what you do not know*

It is important for Australian AgTech businesses to understand the differences in farming systems, operating landscapes, regulations, and culture before embarking on their journey into Vietnam. From capturing receipts on the back of scrap paper, and the different ways chemicals are used on smallholder plots, to navigating capital import and export structures, AgTech companies need to allow sufficient time to learn about their new operating environment. Invest time in learning more than you think you need to know about Vietnam, before embarking on your journey.

### *Invest in building trust and long-term relationships*

Building relationships with local communities, industries, and key stakeholders is critical to enduring success in Vietnam. As a new company, from a different country, you need to spend time building the confidence of local communities in your brand and commitment to the region. This can look like paying wages weekly in cash before

enough trust is built for you to be able to pay wages monthly via bank transfer.

Orlar has been able to overcome the challenges of launching in Vietnam and achieve great success. Orlar currently sells their produce to middle and top-tier supermarkets, as well as the top 200 restaurants across Vietnam. More importantly, they have continued to provide impact in the region through creating jobs and opportunities, as well as providing a sustainable alternative to traditional agricultural practices.

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*"I wouldn't change our experience in Vietnam for anything. We have had the opportunity to learn about our own character, change lives and do something incredible"*

- Dr. Lyndal Hugo, CEO



# Low productivity risks sector growth, export competitiveness and livelihoods

Over the last three decades, Vietnam's agricultural productivity has soared, driven by the intensification of farm production systems. Between 1991 and 2016, animal and crop production increased by more than 200 per cent with land productivity increasing by 79 per cent.<sup>64</sup> But rapid urbanisation, industrial growth and an ageing workforce has increased competition for land, labour and water resources. The pace of growth in land, labour and total factor productivity is now in decline, with Vietnam falling behind regional peers.<sup>65</sup>

The sector needs to increase productivity to meet rising food demand, create sustainable livelihoods and ensure its continued export competitiveness. Agriculture expansion is no longer the silver bullet for boosting productivity - a new model is now required. AgTech could be a key enabler of future productivity growth in Vietnam's agriculture sector.

## AgTech presents new opportunities to increase productivity, including:

- **Precision agriculture** which uses data analytics and machine learning, can increase yields through real-time insights on resource use, water, weather and soil conditions.
- **Risk models** can help farmers prepare for and adapt their practices to deal with a volatile external environment due to climate change.
- **Robotics and drones** can mechanise farm processes, such as harvesting and cultivation to overcome labour shortages and reduce costs and production time.
- **Biometric sensors and artificial intelligence technology** can provide early pest and disease detection.
- **Supply chain technology** can drive efficiencies and increase visibility across the supply chain from farm-to-table, giving assurances to both producers and consumers.



# Poor supply chain integrity threatens lives and livelihoods

Fragmented, opaque, and capital-deficient agricultural supply chains have resulted in low productivity, lost income potential for producers, food waste and poor food quality. Increasing visibility, control, and coordination will be crucial to ensuring that Vietnam's agriculture sector is high-performing and internationally competitive in the future.

Vietnam's supply chain includes millions of smallholder farmers, traders, wholesalers, retailers and exporters. Smallholder farmers are frequently disconnected from markets with many middlemen involved across the supply chain. Transport and logistics infrastructure is poor, with high-value, export-oriented sectors such as aquaculture suffering from a high incidence of equipment degradation, insufficient capacity, and poor-performing technology in cold storage.

Strengthening links between farms, markets and consumers will facilitate income growth for farmers and increase the efficiency of product flows, reducing food waste, and increasing food safety. Some 25 per cent of all food production in Vietnam each year is being lost or wasted.<sup>66</sup> Production of this wasted food uses 10 per cent of land and contributes to around 6 per cent of Vietnam's greenhouse gas emissions.<sup>67</sup> Supply chain challenges have also resulted in foodborne

illness outbreaks and safety-related food product recalls. Reducing the number of links in the supply chain and increasing transparency will help reduce waste, improve food safety and increase the overall productivity of the sector.

AgTech can help to limit the impact of Vietnam's supply chain integrity challenges. AgTech solutions are already improving the transparency of management practices and traceability of products, extending the shelf-life of products through product- or environment-oriented technologies, and enabling rapid quality assessment to identify and limit spread of pathogens.



## CASE STUDY: TE-FOOD

TE-Food formed through a joint venture in 2015 between a Hungarian Erba Ltd and Vietnamese TE Ltd, to solve food fraud through a blockchain-based farm-to-table food traceability system. The venture originated after the two founders connected while studying together at university in Hungary. TE-Food now serves more than 6000 business customers, including international companies like AEON, Big C, and Lotte Mart, and handles 400,000 business transactions each day.

### *Launch in Vietnam*

TE-Food was built with the Vietnamese market in mind, first launching through an agreement with the Ho Chi Minh City Government to tackle food safety through tracing pigs and pork in the region. Dr. Trung Dao Ha, one of TE-Food's founders, worked with the local government to develop and implement the mobile TE-Food solution in the region.

### *Navigating local industry and regulation*

TE-Food benefited greatly from having a key player, the CEO, embedded in the local business community navigating regulations and seeking out opportunities. Leveraging regulatory changes in Ho Chi Minh City provided an entry point for TE-Food that set them up as the logical partner for future regulation in other provinces.

Critical to TE-Food's success was on-the-ground training and implementation. In partnership with the local government, TE-Food successfully trained more than 10,000 people during implementation and provided ongoing local support.










### *Key Learnings:*

- Communicate your intention to enter Vietnam with your connections in Vietnam, both personal and professional, and assess the potential to leverage these connections to form a symbiotic partnership
- Spend time understanding your customers' needs in each new market, appreciating that technical superiority does not equate to better product-market fit
- Understand the Government's priorities in different regions across Vietnam and work with them to find how your product can help solve their biggest challenges
- Invest in connected and motivated local teams and representation in Vietnam to help you navigate the local industry, language, and regulations, as well as to provide ongoing support to your customers

# Critical challenges across different agriculture supply chains

The challenges for Vietnam’s agriculture sector manifest in many ways for different production systems and business types along the supply chain. Some of these challenges are listed in **Figure 4 | Challenges across agriculture supply chains** below:

**Figure 4 | Challenges across agriculture supply chains**

	 <b>Aquaculture &amp; fisheries</b>	 <b>Animal livestock</b>	 <b>Crop production</b>
 <b>Input supply</b> <b>A. production inputs</b>	<ul style="list-style-type: none"> <li>Limited salinity- and disease-tolerance in seed / broodstock</li> <li>Overreliance on imported fishmeal &amp; fish oil feed supplies</li> </ul>	<ul style="list-style-type: none"> <li>Underperforming livestock breeding systems</li> <li>Low availability of locally-tailored vaccines (i.e., for African Swine Fever)</li> </ul>	<ul style="list-style-type: none"> <li>Constrained access to quality (i.e., certified) production inputs</li> <li>Ill-fit machinery (especially to smallholder plots)</li> <li>Growing water scarcity</li> </ul>
	<b>B. enabling services</b>	<ul style="list-style-type: none"> <li>Constrained access to financial services</li> <li>High prevalence of infection in post-larvae</li> </ul>	<ul style="list-style-type: none"> <li>Low-cost efficacy of veterinary services &amp; support</li> </ul>
 <b>Production</b>	<ul style="list-style-type: none"> <li>Mangrove destruction for p. monodon cultivation</li> <li>Environmental degradation from chemical &amp; wastewater mgmt.</li> <li>Growing intensity of disease outbreaks</li> <li>Energy &amp; carbon intensity</li> </ul>	<ul style="list-style-type: none"> <li>Sub-optimal feed cost-efficiency across life-cycle</li> <li>Overreliance on antibiotics</li> <li>Persistent risk of zoonotic disease transmission</li> <li>Limited visibility of real-time productivity</li> </ul>	<ul style="list-style-type: none"> <li>Land degradation from imbalanced fertilisation, saltwater intrusion, and overuse of chemicals</li> <li>Insufficient skill-base for high-quality / certified production at scale</li> </ul>
 <b>Aggregation &amp; logistics</b>	<ul style="list-style-type: none"> <li>Limited traceability driven by limited record-keeping and ‘batch-mixing’</li> </ul>	<ul style="list-style-type: none"> <li>High incidence of food safety issues</li> <li>Limited traceability</li> </ul>	<ul style="list-style-type: none"> <li>Persistently high post-harvest losses</li> </ul>
 <b>Processing &amp; export</b>	<ul style="list-style-type: none"> <li>High rate of rejections from importers</li> <li>Limited returns to VietGAP</li> <li>Marketing risk driven by limited traceability</li> </ul>	<ul style="list-style-type: none"> <li>High incidence of food safety issues</li> <li>Underperformance by outdated and poor quality machinery &amp; equipment</li> </ul>	<ul style="list-style-type: none"> <li>Presence of ‘value-adding’ tertiary processing limited by lack of skills, know-how, and capital</li> <li>Eroding cost advantage in labour-intensive processes</li> </ul>

# Opportunities for Australian AgTech



# Opportunities for Australian AgTech

## *Key points*

- Australia's AgTech innovation ecosystem is rapidly growing and maturing, driven by government-backed innovation programs, multinational engagement and increasing interest from early-stage investors.
- There are strong foundations for commercial, strategic and technical agriculture and innovation partnerships between Australia and Vietnam, supported by well-established public and private sector relationships.
- Many of Australia's AgTech innovators bring solutions and expertise that fit well to the challenges facing Vietnam's agriculture sector, and can address sustainability, climate resilience, productivity and product quality and safety.

To remain competitive, Vietnam's agriculture sector needs to invest in more sustainable, efficient and high-quality production. Digital technologies and AgTech innovations will be a critical part of enabling the sector to reach its potential. Businesses that can harness the strengths of the existing Australia-Vietnam relationship and the Australian AgTech ecosystem are well positioned to capitalise on opportunities.

## The Australian AgTech and innovation ecosystem is burgeoning

Australia's AgTech and innovation ecosystem has grown significantly in recent years, and is well-positioned to leverage its strengths to explore and drive opportunities in Vietnam.

Australia has a long history of investing in vital agriculture research and development, which has underpinned the sector's sustained productivity growth. The Government has co-invested in Rural Research and Development Corporations (RDCs) with primary producers to drive agricultural innovation for over 30 years. There are 15 RDCs today, 5 of which are Commonwealth statutory bodies. Over the past 5 years, Federal and State Government initiatives have catalysed

cross-national collaboration to drive the commercialisation and adoption of AgTech innovations. In 2020 the Australian Government announced the creation of Agricultural Innovation Australia, led by RDCs, to drive a cross-industry approach to agricultural innovation. The Government also committed \$86 million to establish eight drought resilience innovation hubs in 2020, and \$150 million of agriculture and food focused funding to CSIRO in 2021.<sup>68</sup> State Governments are also investing heavily in the sector. For instance, in 2020, the Queensland Government announced a \$3 million investment in an AgTech and Logistics Hub to be established in Toowoomba.<sup>69</sup>

**Figure 5 | Australian AgTech innovation ecosystem**

**Northern Territory**

**Hubs**

- Northern WA/NT Drought & Innovation Hub

**Western Australia**

**Programs**

- Harvest Accelerator

**Hubs**

- South West WA Drought & Innovation Hub
- Western Australian Food Innovation Precinct

**Queensland**

**Programs**

- AgFrontier Australia

**Hubs**

- AgTech & Logistics Hub
- Southern QLD/ Northern NSW Drought & Innovation Hub
- Tropical North Queensland Drought & Innovation Hub
- Bargara AgTech Hub

**New South Wales**

**Programs**

- Cicada Growlab
- SparkLabs Cultiv8
- AgFrontier Australia
- Farmers2Founders

**Hubs**

- SMART Farm Innovation Centre
- The GATE (Global AgTech Ecosystem)
- AgriPark
- Agribusiness precinct for the Western Parkland City
- Southern NSW Drought & Innovation Hub

**Australian Capital Territory**

**Hubs**

- Centre for Entrepreneurial Agri-Technology

**South Australia**

**Programs**

- ThincLab

**Hubs**

- South Australia Drought & Innovation Hub

**Victoria**

**Programs**

- Sprout X
- RocketSeeder
- AgriFood Evolution

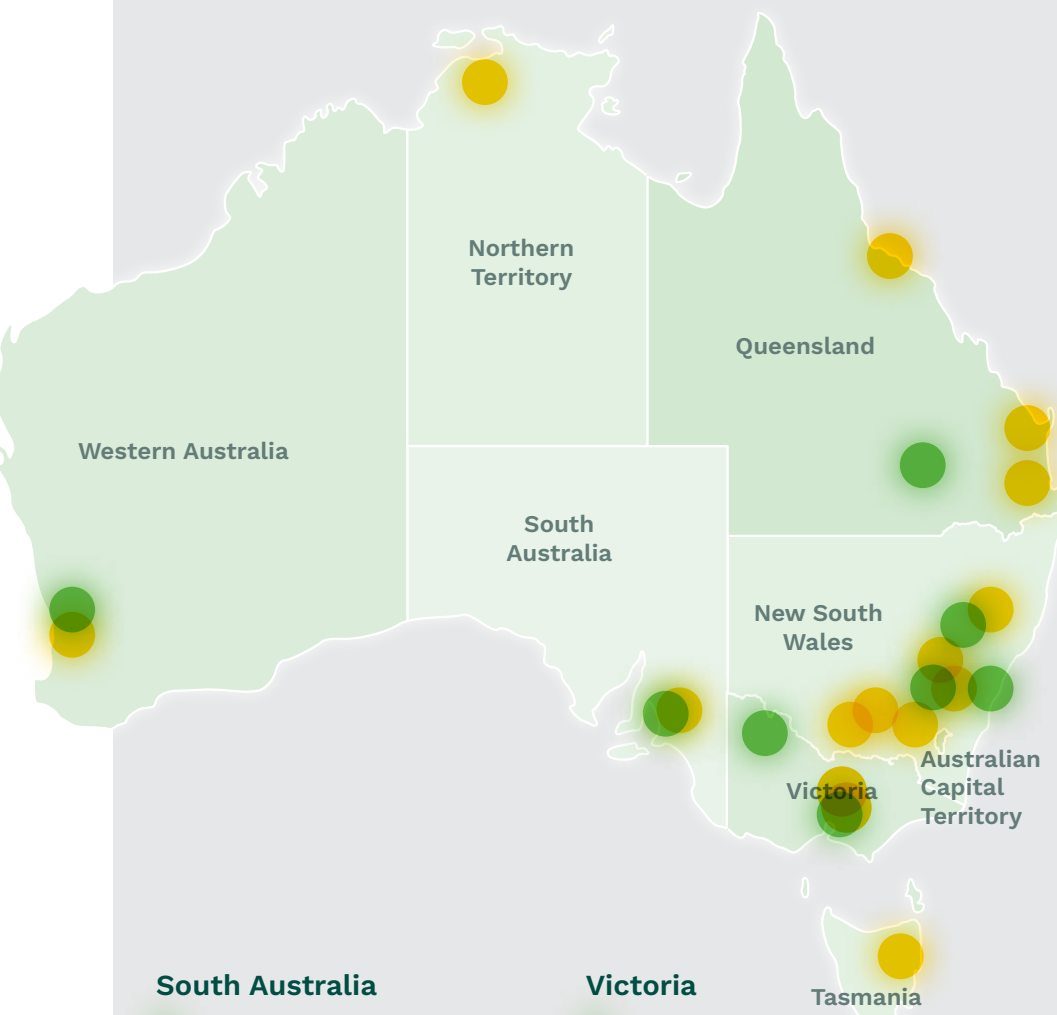
**Hubs**

- AgriBio
- Victoria Drought & Innovation Hub

**Tasmania**

**Hubs**

- Tasmania Drought & Innovation Hub



But the most critical element of Australia's AgTech ecosystem is the creativity and entrepreneurial strength of the growing field of AgTech innovators across the country. From the launch of the first Victorian AgTech business accelerator, SproutX, in 2016, there are now more than 300 startups, scaleups and enterprises, a rich pool of accelerators and incubators, and increasing collaboration with industry groups, world-leading universities and research institutions (see **Figure 5 | Australian AgTech innovation ecosystem on page 24**). Multinational corporations such as Chobani, Coca-Cola Europacific Partners, Mondelez and Mars have launched their own accelerator programs in the past five years. Other noteworthy players include SparkLabs Cultiv8, CSIRO Mission, the Australian AgriTech Association, Harvest and Cicada Innovations.

These organisations and programs support the development of incremental and disruptive innovations and have gathered significant momentum and investor attention. Recent deals include AgriWebb closing a \$30 million Series B funding round with Telus Ventures;<sup>70</sup> ReGrow closing a \$23 million Series A funding round with Ajax Strategies, Tenacious Ventures and Cargill;<sup>71</sup> and the acquisition of AgWorld by Semios in 2021.<sup>72</sup>

Public and private sector investors are coming together to catalyse AgTech opportunities. The sector attracted \$30 million of capital in 2017, and by 2019 this had tripled to \$90 million.<sup>73</sup> Key examples are:

- In 2019, Grains Research and Development Corporation and Artesian Venture Partners partnered to establish the \$50 million GrainInnovate fund to boost innovation in the grains industry.<sup>74</sup>
- In 2021, Tenacious Ventures Fund, backed by commitments from the Australian Government Clean Energy Finance Corporation and others, achieved \$35 million in funding. Tenacious' goal is to support early stage startups with tech-enabled new business models and transition agriculture towards a carbon neutral future.<sup>75</sup>
- In 2021, Main Sequence, a deep tech investment fund founded by CSIRO, raised \$250 million for its second fund to continue investments in science-powered companies.<sup>76</sup>

Further appetite to deepen international engagement and collaborations in AgTech is on the horizon. Australian AgTech is not new to the global stage, and Australian AgTech start-ups have participated in scale up programs like the Cultivation Corridor and Plug and Play programs and won FoodBytes! Pitch 2020. Publicly funded initiatives will continue to support this shift in focus from domestic to global, with CSIRO's Aus4Innovation a standout example. Other programs such as GRAFT India, GRAFT Vietnam, Grow2Asia and Mekong AgTech Challenge (MATCH) will continue to raise the profile of Australian AgTech and deepen these engagements. This momentum will only further catalyse AgTech innovations in Vietnam as investments mature and more players are drawn to the sector.



## CASE STUDY: AGUNITY

Launched in 2016, AgUnity's mission is to enhance financial inclusion for those living in rural and remote communities worldwide. AgUnity has built a blockchain-based app that allows farmers to record their work, perform farm-focused transactions, cooperate with other farmers and take their crop to market. The AgUnity app offers a suite of digital solutions that provides a means to reach remote users, establish reliable and efficient lines of trade and create transparency in food chains.

### *Leveraging bilateral business support programs*

AgUnity first entered Vietnam through the Mekong AgTech Challenge (MATCH), an initiative of the Mekong Business Initiative (MBI) sponsored by Australian Aid. AgUnity embarked on a highly-curated immersion market entry program, engaging with key industry stakeholders including government representatives, universities, and local producers. The company proved to be a standout, named as the 'winner' of the challenge amongst 10 participants from across the globe.

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*"We knew there was massive potential for AgTech/FinTech in Vietnam, and our MATCH experience provided a direct pathway."*

- Angus Keck, COO AgUnity

In particular, the program unlocked cultural learnings that proved critical to improving the product development process. Deep engagement revealed that direct feedback is relatively uncommon in Vietnamese business culture. AgUnity shifted tack, learning to intensify their presence and thoughtfulness in the questions they asked, rather than procure feedback directly.

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*"I was able to be interviewed on Vietnamese national television through MATCH, this was the kind of exposure you only dream of in a new country."*

- David Davies, CEO AgUnity

### *Designing a product and team with Vietnam in mind*

Based on this immersion program, AgUnity learned that the needs of smallholder farmers were varied, requiring a highly customisable solution. The AgUnity app is designed as a super-app, with the ability to push out easily customisable applets. AgUnity prioritised making the app easy to use, even for people with a low level of literacy, through keeping the interface simple, using geometric shapes and primary colours, and completing processes in a step-by-step fashion.

As part of AgUnity's product offering, they provide both the infrastructure, a low-cost smartphone, and the software, an app. This enabled AgUnity to overcome one of the initial barriers to entry for their technology, which was the producers' lack of access to smartphones.

Angus Keck, AgUnity COO, shared that the AgUnity team have also been busy developing onboarding materials and guidelines for establishing and supporting remote teams. Setting up localised teams enabled AgUnity to invest in the local industry as well as overcome translation barriers.



*“There was an incredible amount of enthusiasm for the technology we had built by Vietnamese farmers we met as part of MATCh. Without this exposure, we would not have been approached to start operations in the country.”*

- Angus Keck, COO AgUnity

### ***Partnering for success***

To continue work in the region, AgUnity has partnered with Action On Poverty to deploy AgUnity technology for the Da River Fisheries Association. As Action On Poverty is well established in Vietnam, AgUnity has been able to leverage their connections to local government and understanding of local regulations, as well as their relationship with a farmers’ cooperative in an industry AgUnity was previously not exposed to in Vietnam.

*“The opportunity to travel Vietnam meeting agribusinesses, local government, and industry organisations gave us an insight into business in Vietnam that we would never have otherwise known. This insight eventually led to us securing our first contract to deliver services in the Vietnamese fisheries industry.”*

- David Davies, CEO AgUnity

### ***Connecting Consumers***

In July 2021, AgUnity helped launch AgriUT, a digital utility token that can be purchased by trading companies and retailers, to sell to customers who purchase their products such as coffee. Customers can scan food-safe QR-code tags on the products they purchase and link these rewards back to the farmers.<sup>77</sup> This also enables global commodity traders to pay farmers in AgriUT in locations that utilise difficult to disperse fiat cash.

# Australian AgTech businesses already have a strong foundation for collaboration

Australia and Vietnam have a strong and long-standing relationship, facilitated by connections across government, business and education sectors. These connections provide a solid foundation to help Australian businesses identify partnerships and entry points to the Vietnam market.

The Australia-Vietnam trade relationship is increasingly important to both nations. Vietnam is Australia's fourteenth largest trading partner, and was Australia's sixth largest agricultural export market in 2019-20, worth \$1.8 billion.<sup>78</sup> The relationship is supported by the ASEAN-Australia-New Zealand Free Trade Agreement and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, which reduce trade barriers and tariffs and streamline movement of goods. In recognition of the importance of the bilateral relationship, both governments have committed to developing an Australia-Vietnam Enhanced Economic Engagement Strategy (VEEES), which will be finalised in 2021.

The Australian Government has demonstrated its commitment to strengthening Vietnam's agriculture sector by funding local programs and research initiatives. For example, DFAT has invested in the Partnership for Sustainable Agriculture in Vietnam (PSAV) through a broader cross-regional partnership with the World Economic Forum's Grow Asia Initiative. This partnership is housed directly within Vietnam's Ministry of Agriculture and Rural Development, and has brought together over 120 organisations to strengthen regional cross-supply chain linkages. On the research front, the Australian Centre for International Agricultural Research (ACIAR) has managed a dedicated program to strengthen agricultural research, development, and extension in Vietnam since 1993. The program has delivered 175 projects across its lifetime, and invested \$5.6 million in research for development projects in 2018-19 alone.<sup>79</sup> Its priorities include food safety, climate change, soil fertility, efficiency of crop-livestock systems, market access and increasing value from aquaculture.<sup>80</sup>

In recent years, the Australian Government has taken a more targeted approach to supporting bilateral agricultural innovation cooperation by facilitating pathways for innovators to bring their expertise and capabilities to Vietnam. A noteworthy example is the Aus4Innovation program, a development assistance program managed by CSIRO in partnership with Vietnam's Ministry of Science and Technology. Through this program, Australia has invested \$13.5 million to explore Industry 4.0 opportunities, trial new models for public-private partnerships and build capability in scenario planning and commercialisation in Vietnam.<sup>81</sup> Of the 12 Innovation Partnership Grants funded through this program, seven are focused squarely on food and agriculture.

Government has not been the only driver of partnerships in Vietnam's food and agriculture sector. Businesses have also focused on building corporate relationships, supporting capability development and participating in bilateral programs. For example, Sunrice was one of the earliest international companies to buy a mill and be granted an export license in Vietnam. Sunrice's research currently focuses on traceability and increasing profitability with better post-harvest quality. In the education sector, three Australian universities – RMIT, Western Sydney and Swinburne – have campuses in Vietnam.

Government, corporations, and investors have jointly supported Australian innovators to forge successful pathways into the Vietnam market. For example, the Vietnam Business Booster program was developed with DFAT funding by Haymarket HQ in partnership with Acclime Vietnam to help companies across sectors to develop a market entry strategy for Vietnam.<sup>82</sup> The GRAFT Challenge Vietnam 2021, in particular, has directly focused on the opportunity for AgTech innovation in Vietnam.



## CASE STUDY: CSIRO AND VIET-UC

Vietnamese corporations have, in several cases, taken it upon themselves to proactively engage with the Australian agricultural innovation ecosystem. The longstanding Viet-Uc and CSIRO partnership is a case in point. Viet-Uc, a leading aquaculture company in Vietnam and CSIRO, the Australian Government's research and innovation agency, have created a productive relationship bringing together Vietnamese agribusiness and Australian innovation. The partnership is built on shared purpose and trust.

For more than a decade CSIRO and Viet-Uc have worked together to solve key challenges in the aquaculture industry. In 2017 they decided to try something different by embedding a CSIRO representative within Viet-Uc. Setting up the secondment was not easy however, requiring external advice to navigate complex regulatory and tax implications. Whilst the program itself



was successful, it also laid the foundation for future success through building capacity and capability within Viet-Uc. This allowed Viet-Uc to continue to build on the work even after the CSIRO representative had left Vietnam.

## CASE STUDY: GRAFT

Incubator and accelerator programs for early-stage startups have grown in prevalence across Southeast Asia, including Vietnam. Some of these have even featured a focus on the AgTech space, including the Mekong AgTech Challenge (MATCH) in 2019, and the IFC's "AgTech Vietnam" program in 2021. Still, the list of market-ready, international AgTech solutions making waves in Vietnam remains short.

### *Being 'complementary', not just 'supplementary': a multidisciplinary partnership to fill a market need*

With support from the Aus4Innovation program, GRAFT Challenge Vietnam 2021 brings a first-of-its-kind 'land and launch' program focused on scaling AgTech solutions to solve Vietnam's most pressing agrifood challenges, as posed by industry leaders themselves. The program leverages the complementary strengths of its bilateral partners - comprising Beanstalk, an Australian-based agrifood innovation agency; Mekong Business Initiative (MBI), a critical node of the Vietnam start-up ecosystem; and Digital Agriculture Association of Vietnam (VIDA), a leading proponent and connector dedicated to the digitisation of Vietnam's agri-food supply chain - to deliver bespoke support on both the 'supply' and 'demand' side of the AgTech equation.

### *Being intentional: starting with a 'challenge-led' approach*

The GRAFT team started by collaborating with Vietnamese agrifood industry leaders to identify challenges in the country's crops and plantations, fisheries and aquaculture, and livestock businesses. GRAFT then launched an intensive, targeted global search for AgTech entrepreneurs with solutions that could solve these challenges. The final cohort of nine AgTech scale-ups announced in August 2021 represents a

heavily-vetted and highly-capable group of innovators, with solutions including AI-driven software-as-a-service that brings transparency to the agriculture value chain, digital platforms that leverage data analytics to help farmers improve productivity and reduce carbon footprints, precision data-powered farm management tools that improve feed livestock efficiency and health outcomes, and more.

### *A bespoke approach: there is no 'one-size-fits-all' for scale-ups*

The scale-ups are receiving tailored support from the GRAFT team, industry leaders, and technical advisors to benchmark and improve their readiness to enter and scale into Vietnam. The focus is on establishing foundations for long-term success and commercial partnerships in the market, rather than making generalised and transactional connections. The program is supporting participant scale-ups to refine product-market fit, establish channel and advisory partnerships, stand up trials, and establish an on-ground presence in Vietnam. Industry partners continue to engage deeply with the program, benefitting from curated and facilitated interaction with scale-ups and ecosystem stakeholders.





# Opportunities for Australian AgTech businesses to address key challenges in Vietnam

There are opportunities for Australian AgTech businesses across the breadth of Vietnam's agriculture sector. Among these, we have identified areas where Australian innovators with experience in sustainability, climate resilience, productivity and food quality and safety can build partnerships and collaborate with producers to address pressing challenges in Vietnam.

## Sustainability

Australia and Vietnam face common systemic environmental challenges which have the potential to constrain the growth of their agricultural output. Australian farmers invest at least \$3 billion a year in natural resource management.<sup>83</sup> There are ongoing industry-led initiatives to improve sustainability frameworks and best practice tools across dairy, red meat, pork, rice and other agriculture products.<sup>84</sup>

AgTech solutions are already having an impact. Agricultural innovations such as precision agriculture, sensor technologies and artificial intelligence can be used to measure exact inputs required and monitor growth in real-time. These data insights can aid in decision-making, avoid wasting inputs and mitigate environmental pollution.

### Australian sustainability and technology innovations

- ThinkBio specialises in the research, development and commercialisation of biological inoculants for agriculture. They are currently working on a smallholder-friendly formulation and delivery mechanism for their biological nitrogen replacement product.
- SWAN Systems is a precision irrigation software platform that leverages IoT to help farmers synthesise data from multiple sources for more precise irrigation and nutrient management and better environmental outcomes.



## Climate resilience

Australia is the driest inhabited continent. The Australian agriculture sector has had to continuously overcome harsh environmental conditions such as droughts, bushfires, heatwaves and floods. On top of this, both Australian and Vietnamese farmers face uncertainty in climate conditions due to climate change.

Climate smart agriculture technologies, such as improved irrigation facilities, will help combat challenges brought about by climate change, such as shifting rainfall patterns. Both Australian and Vietnamese farmers will need to make long-term investments to build farm resilience to changing climatic conditions to reduce the impact on agricultural outputs and farm incomes.<sup>85</sup>

### Australian climate resilience and technology innovations

- Hillridge Technology uses satellite data and predictive algorithms to de-risk weather index insurance for growers and underwriters. Their technology generates an in-app price in milliseconds, then issues payout directly.
- ReGrow (formerly FluroSat) provides data-driven agronomy and sustainability solutions help producers build yield and climate resilience and connect to carbon markets. It offers a single, science-backed platform for agricultural producers to measure, report, and verify soil health and carbon outcomes.

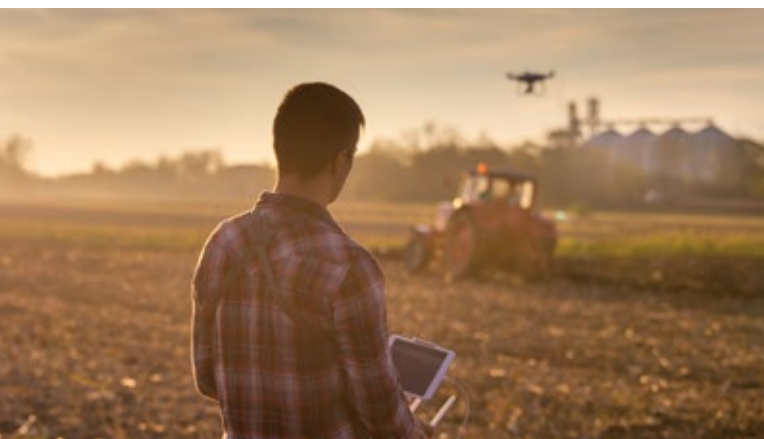
## Productivity

Australian farms rate among the most efficient globally. Australia's Total Factor Productivity growth rate of 1.6 per cent per year puts Australia among global leaders such as the US (1.8 per cent) and Canada (1.2 per cent).<sup>86</sup> Technology is a significant enabler of agricultural productivity. Innovations such as risk modelling, robotics and drone technology can be used to prepare for volatile environmental conditions, mitigate risks, mechanise and automate processes to reduce labour costs and time.

Both Australia and Vietnam are export-oriented and face seasonal variations and water management challenges that have the potential to significantly impact outputs. Improving long-term productivity is important to maintain export competitiveness.

### Australian productivity and technology innovations

- The Yield builds secure, scalable digital technology which combines hardware, data analytics and user-friendly apps. These AgTech solutions can be applied across the food chain to help increase yield, reduce waste, mitigate risks and costs associated with bad weather, and aid environmental sustainability.
- AgriWebb offers a cloud-based farm management software that helps farmers improve transparency, profitability and sustainability across the supply chain through data driven decision making. They have recently raised \$30 million for a cattle farm management system.<sup>87</sup>
- Beyond Ag transforms food waste into insect protein for livestock feed and uses insect manure to create organic fertilisers, and reduce the burden on the environment.





## Food quality and safety

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Food quality and safety is a common concern for both countries. Food fraud, including product counterfeiting, substitutions and mislabelings, costs the Australian economy nearly \$2 billion per year.<sup>88</sup>

Australia has a strong reputation in supply integrity, quality retention and using improved inputs and novel farming methods that minimise residue. As Vietnam consumers are very concerned about food safety, this is a complementary area of opportunity. Both producers and consumers want greater transparency, quality assurance and rapid tracing capability as food journeys from farm to table.

Agricultural innovations such as blockchain, QR codes and DNA tracing are already being used to address concerns about provenance, provide visibility over food production and its journey through the supply chain and boost consumer confidence in food purchases.

### Australian food quality and technology innovations

- AgriDigital is involved in digitising and growing grain supply chains to connect participants including farmers, elevators, traders and consumers.
- Trust Provenance provides a traceability platform that captures touchpoints along a product's journey in real-time, securing the data points in the blockchain. Producers, packers, processors, retailers, quality inspectors and consumers can access the data to track a product's journey.

# Positioning for success in Vietnam: What AgTech businesses and Government can do

# Positioning for success in Vietnam: What AgTech businesses and Government can do

AgTech opportunities in Vietnam are evolving rapidly, and Australian businesses need to act now to capitalise on the momentum in the sector. Both business and government have critical roles to play to position Australian innovators to pursue AgTech opportunities and partnerships in Vietnam.



# Roadmap for Australian AgTech businesses

It is clear there are opportunities for Australian AgTech businesses across Vietnam’s agriculture sector. However, accessing these opportunities presents a range of challenges for businesses, even those who have other market entry experience. Understanding the market, adapting products to fit local requirements, identifying appropriate entry points, and navigating Vietnamese regulations, legal systems and relationships require significant consideration and support.

To address some of these practical concerns, we have developed a roadmap which outlines key steps and lessons to help Australian AgTech businesses understand how to prepare for market entry.

Phase	Key steps	Example
<b>Understand the market to address product fit and market entry practicalities</b>	<p><b>a. Adapt your product to the market</b></p> <ul style="list-style-type: none"> <li>• Reassess your product-market fit with respect to the diversity, smallholder-density, fragmentation, and export-orientation of Vietnam’s agriculture sector. Understand and identify the pain-points specific to the sub-market you are solving for.</li> <li>• Understand how the challenges faced by your prospective customers and partners will inform how they engage with your solution - i.e., emphasising usability in low-tech environments rather than technical superiority.</li> </ul> <p><b>b. Understand the operating environment</b></p> <ul style="list-style-type: none"> <li>• Understand the differences between Australian and Vietnamese operating environments, including intellectual property protection and tax obligations.</li> <li>• Identify the ultimate decision-maker for your product’s adoption. Depending on the market and product, this could be government bodies, channel partners, or smallholder farmers themselves. Within agribusinesses, this could be the CEO or another lead commercial executive, rather than research and development teams or middle management.</li> </ul>	<p>ThinkBio’s Kreotec product, which replaces up to 40 per cent of a farmer’s nitrogen need, was built to be deployed in large-scale agriculture systems. But the team intentionally adjusted their offering to fit smallholders’ needs in Vietnam. This has included:</p> <ul style="list-style-type: none"> <li>• Pursuing a new stabilisation process for their product to fit the lack of cold chain infrastructure in Vietnam’s input supply chain.</li> <li>• Scaling down their product sizes to fit storage and application needs for smallholder farmers.</li> <li>• Changing the type of packaging, and formulating their products to fit - starting with a water soluble product enabling application via knapsack sprayers common to the region.</li> </ul>

Phase	Key steps	Example
<b>Identify pathways for entry</b>	<p><b>a. Leverage existing foundations</b></p> <ul style="list-style-type: none"> <li>• Take advantage of existing personal, commercial, and trade relationships between Australia and Vietnam.</li> <li>• Identify bilateral business support programs and initiatives like GRAFT and Vietnam Business Booster that can accelerate your connections and entry into the market.</li> </ul> <p><b>b. Take advantage of favourable policy and regulation</b></p> <ul style="list-style-type: none"> <li>• Understand and take advantage of Vietnamese government policies, regulatory changes and programs, including at the municipal level, that encourage innovation and digitisation in the agriculture supply chain.</li> <li>• Understand which Vietnamese government agencies to engage beyond the Ministry of Agriculture and Rural Development (MARD), including the Ministry of Science and Technology (MOST), Ministry of Information and Communication (MIC) and Ministry of Planning and Investment (MPI).</li> </ul>	<ul style="list-style-type: none"> <li>• Through the Mekong AgTech Challenge (MATCH) Program, AgUnity were able to establish partnerships with local producers, universities and the Mekong Business Initiative that have been vital in their future development in the region.</li> <li>• Ho Chi Minh City brought in mandatory traceability legislation that provided a launchpad for TE-Food to test and implement their technology in the region.</li> </ul>
<b>Build connections in the market</b>	<p><b>a. Establish local partners and an on-ground presence</b></p> <ul style="list-style-type: none"> <li>• Where possible, spend time in the market to understand Vietnamese business culture, identify local partners, and build strong local connections.</li> <li>• Identify partners that can help navigate local regulations, industry requirements and overcome language barriers. Engage local partners early to test products with growers and ensure a strong working relationship.</li> <li>• Leverage existing touchpoints of the start-up and innovation ecosystem in Vietnam, many of whom are adept and trusted international match-makers for innovation in adjacent technology segments.</li> </ul>	<ul style="list-style-type: none"> <li>• When Orlar first began, Dr Lyndal Hugo, CEO, travelled to Vietnam to immerse herself in the culture and build an understanding of business and operational environment in Vietnam.</li> <li>• CSIRO and Viet-Uc have developed an enduring relationship built on mutual respect and trust, where they work together to solve challenges from inception to implementation.</li> </ul>

# How the Australian and Vietnamese Governments can support

Both Governments can play a crucial role in supporting Australian businesses to develop the knowledge and capabilities required to pursue opportunities in Vietnam. There are a number of practical steps that they can take to address key challenges faced by AgTech businesses, and continue to build on the existing foundation for productive long-term engagement between Australia and Vietnam on agricultural innovation.

## 1. Foster connections between Australian AgTech businesses and Vietnam

Recommendations	Rationale	Example
<p><b>The Australian Government should continue to support bilateral business support programs that connect Australian AgTech businesses with Vietnamese partners and industry</b></p> <p><b>a. Extend funding to multi-year bilateral business programs.</b></p> <p><b>b. Open more frequent application windows.</b></p> <p><b>c. Where possible, assist Australian AgTech companies to embed staff in Vietnamese agri-businesses.</b></p>	<ul style="list-style-type: none"> <li>• These programs are critical for AgTech companies looking to expand into Vietnam. They provide support and coaching on their products and how to overcome barriers in the market, but also invaluable introductions and local connections that can form the basis of future partnerships and expansions.</li> <li>• Multi-year programs have the potential to be more effective by building momentum and leveraging growing industry networks for industry engagement.</li> <li>• Transitioning to more frequent application windows will allow businesses to move quickly and prepare more effectively for opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>• GRAFT Challenge Vietnam 2021 is a ‘land and launch’ program focused on scaling AgTech solutions to solve Vietnam’s most pressing agrifood challenges. Nine scale-ups from six countries are receiving tailored support from the GRAFT team, industry leaders, and technical advisors to benchmark and improve their readiness to enter and scale into Vietnam.</li> <li>• CSIRO and Viet-Uc had to navigate complex operational and financial challenges to realise the benefits of embedding CSIRO staff embedded within Viet-Uc. Experienced advisory capacity to manage tax, benefit, and operational requirements could support this model’s scalability.</li> </ul>



Recommendations	Rationale	Example
<p><b>The Australian Government should consider providing grant support for AgTech pilots</b></p> <p>a. Provide grants to support pilot programs for AgTech businesses following on from bilateral business support programs.</p> <p>b. Grant programs should be accompanied by a dedicated outreach program to increase awareness among AgTech businesses of the opportunities.</p>	<ul style="list-style-type: none"> <li>Grant support can help Australian AgTech companies take advantage of the connections made during bilateral business support programs and act quickly to nurture the relationships and turn them into viable commercial partnerships.</li> </ul>	<ul style="list-style-type: none"> <li>Off the back of MATCh, AgUnity made great connections and developed a proposal for a trial involving a Vietnamese University, the owner of a large rice mill, and MBI. However, a lack of available funding meant that AgUnity was unable to implement this trial, delaying AgUnity's entry into Vietnam.</li> </ul>

## 2. Simplify and streamline practical export requirements for AgTech businesses, in line with the long-term strategy for the sector

Recommendations	Rationale
<p><b>Identify AgTech as a priority in the Vietnam Enhanced Economic Engagement Strategy (VEEES)</b></p> <p>a. Ensure the opportunity and strategy for the AgTech sector is clearly articulated in the VEEES</p>	<ul style="list-style-type: none"> <li>Highlighting the importance of the sector and key opportunities for businesses will increase confidence of Australian AgTech businesses. The Strategy must be backed up with funded initiatives to further catalyse the sector.</li> </ul>
<p><b>Both Governments should reduce non-tariff barriers</b></p> <p>a. Work with the Vietnamese government to address non-tariff barriers to trade</p>	<ul style="list-style-type: none"> <li>Australian AgTech businesses looking to enter the Vietnam market face challenges around navigating local regulatory requirements and legal systems. Addressing priority non-tariff barriers to trade would enable businesses to seize opportunities quickly.</li> </ul>
<p><b>Both Governments should support information flow to AgTech businesses</b></p> <p>a. Create an information portal for Australian AgTech businesses</p>	<ul style="list-style-type: none"> <li>Stakeholder interviews identified a need for support services and advice to facilitate market entry, and demystify regulations. Federal and State Government agencies can help streamline information and services to make it this more accessible.</li> </ul>

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