



The economic contribution of the Tasmanian fresh produce sector

Australian Fresh Produce Alliance

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Glossary

Acronym	Full name
ABS	Australian Bureau of Statistics
AFPA	Australian Fresh Produce Alliance
FTE	Full-time equivalent
GDP	Gross domestic product
GSP	Gross state product
GVP	Gross value of production
LGA	Local Government Area
SWP	Seasonal Worker Program
WHM	Working Holiday Maker

Executive summary

Background and purpose

The fresh produce sector, comprising fresh fruits and vegetables destined for immediate human consumption, is a major economic presence in Tasmania, particularly in regional communities.

Despite the sector's size and role in stimulating economic activity and employment in regional areas of Tasmania, its importance to the local economy is often not fully appreciated. This report presents an estimate of the value added by the sector to the Tasmanian economy, and the direct and indirect employment supported by it to show the scale and extent of the industry's impact. The report also considers some of the challenges for the industry's future growth.

The Tasmanian Fresh Produce industry directly and indirectly contributes \$336.7 million to the economy

Together, the direct and indirect contribution to Tasmania's economy totals \$336.7 million and represents approximately 11 per cent of total agricultural value added, and 1.1 per cent of Tasmania's economy. The breakdown between the direct and indirect contribution in Tasmania's economy is shown in the table below. This analysis does not consider the impact of downstream sectors including logistics, retail and food service, nor the impact of the indirect contribution to the Australian mainland economy.

Table 1.1: Economic contribution of the Tasmanian fresh produce sector in 2018-19

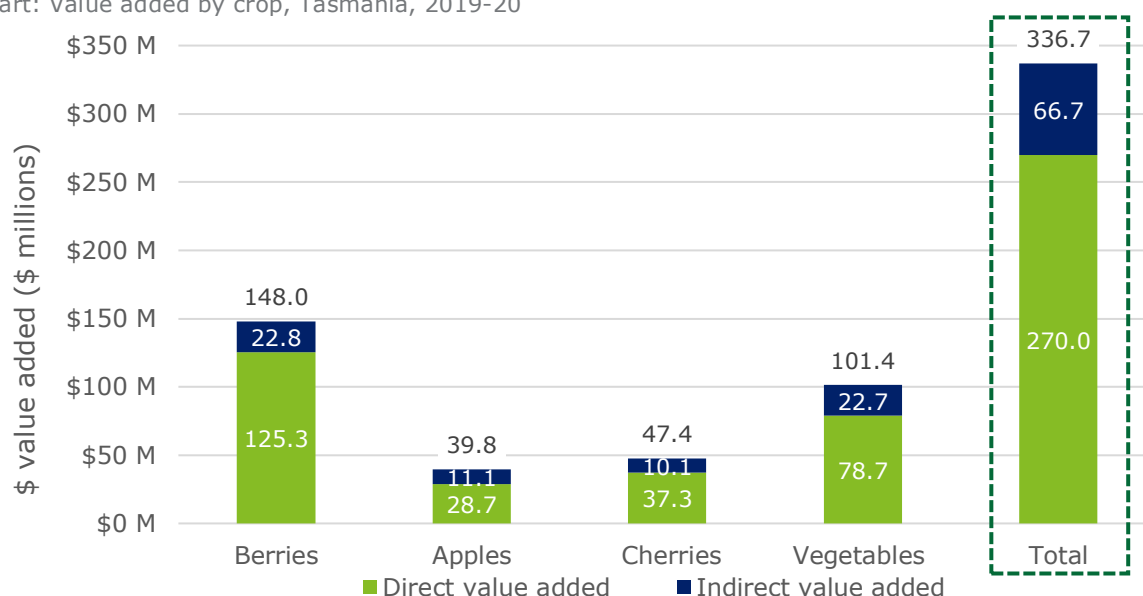
Activity	Direct contribution	Indirect contribution	Total contribution
<i>Value added (\$m)</i>	\$270.0	\$66.7	\$336.7
<i>Employment (FTEs)</i>	2,708	349	3057

The direct contribution of the fresh produce industry in Tasmania of \$270.0 million consists of \$37.3 million in direct value added from cherries, \$125.3 million from berries, \$78.7 million from vegetables and \$28.7 million from apples.¹ A total of 2,708 full-time equivalent workers (FTEs) are employed by the fresh produce industry.

The industry supports a further \$66.7 million in indirect value added as a result of the inputs it uses and a further 349 FTEs in these industries that supply inputs to the fresh produce sector.

¹ Notes: (1) FTE data collected for the apple industry includes other pome fruit, such as pears, however the revenue data provided is from an apple grower.

Chart: Value added by crop, Tasmania, 2019-20



Note: Economic contribution was estimated using the Deloitte Access Economics Regional Input-Output Model (DAE-RIOM). An overview of the DAE-RIOM is provided in Appendix B.

Source: Deloitte Access Economics.

Economic contribution represents the value added to the economy arising from the activities of the Tasmanian fresh produce sector. It is the sector's unique contribution to the economy and captures the value of its production and labour, excluding the cost of goods. In other words, it represents the industry's revenue (estimated at \$458.1 million) exclusive of its non-labour input costs. This figure is estimated using the Deloitte Access Economics Regional Input Output Model (DAE-RIOM) with revenue as an input.

Comparatively, other measures of the industry's size, such as gross value of production, represent the income earned from the sale of produce and therefore include the cost of intermediate inputs to production – which are part of another industry's contribution to the economy.

The following table summarises the different metrics presented in this report, with a more detailed table shown in Appendix C.

Table 1.2 Summary of metrics presented in report

Metric	Value (\$m)	Measuring	Report Reference
Total value of fruit and vegetable production (including processing)	\$339.4	Gross value of production	Chapter 2
Total value of fresh produce (all fruits and vegetables, excluding processing)	\$309.7	Gross value of production	Chapter 2
Total revenue of four crop types considered (berries, apples, cherries, vegetables)	\$458.1	Revenue	Chapter 3
Direct value added of the four crop types	\$270.0	Economic contribution	Chapter 3
Indirect value added of the four crop types	\$66.7	Economic contribution	Chapter 3
Total value added of the four crop types	\$336.7	Economic contribution	Chapter 3

Note: It is assumed that for most grower's revenue is equivalent to the gross value of production. However, this figure differs from gross value of production as growers consulted by Deloitte indicated that public ABS data under-represents the true value of Tasmanian production.

Implications of this study

The fresh produce sector is a key part of the Tasmanian economy, directly employing approximately 2,700 full-time equivalent (FTEs) positions in 2018-19, with many of these roles being located in regional communities.

Full-time, ongoing roles in the fresh produce industry are typically higher skilled jobs, in roles such as quality assurance, agronomy or sales and administration. The industry also employs a large number of people to undertake more short-term roles, typically harvest work.

While the sector supports significant local employment, it often faces challenges accessing the labour it needs locally and relies on workers, typically temporary migrants, moving from similar roles on the mainland to Tasmania to undertake harvest work. Historically, many of those moving to Tasmania to undertake harvest work have been working holiday maker (WHM) visa holders, backpackers, or part of the seasonal worker program (SWP).

While the use of backpackers is sometimes viewed negatively by the public, the industry's use of backpackers in Tasmania can provide significant flow on benefits to the broader Tasmanian economy through spend in local communities on accommodation, food and beverage, and other tourist activities.

The fresh produce industry in Tasmania adds significant value to the freight and logistics sector due to the need to ship fresh produce in a timely and efficient manner both intra and inter-state. Access to timely and affordable freight is critical. This is because it directly affects competitiveness of the Tasmanian fresh produce sector compared to mainland growers. The challenge is particularly pronounced for vegetable growers given the relatively higher weight per volume of produce compared to fruit, along with a lower shelf price, on average.

Growers noted that these export challenges limit opportunities for the local industry to grow. This is because growers are hesitant to invest in expanding production volumes if there is a risk they will not be able to affordably export crops before their quality – and ultimately price – diminishes.

Similarly, labour shortages limit the ability of the industry to expand – a topical issue due to ongoing border closures as a result of COVID-19. As with the export challenges, growers are often hesitant to invest in expanding their growing capacity if there is a risk their crops cannot be picked during the harvest season.

Addressing these challenges could signal confidence in the Tasmanian fresh produce industry and encourage growers to expand production volumes, and ultimately the sector's contribution to the Tasmanian economy.

Deloitte Access Economics

1 Introduction

1.1 Tasmania's fresh produce sector

Tasmania's fresh produce sector comprises fresh fruits and vegetables that are destined for immediate human consumption. The fresh produce sector is a major economic presence in Tasmania but also Australia more widely, particularly in regional communities. The sector sustains many regional communities through capital investment in farms, employment, and spending on inputs.²

The fresh produce sector is particularly important to the Tasmanian economy. The gross value of production (GVP) of fresh produce in Tasmania is estimated to be worth over \$300 million annually.³ Across Australia, fresh produce is a \$7.8 billion industry.⁴ This means that while the Tasmanian economy only accounts for 1.6 per cent of Australia's gross domestic product (GDP)⁵, fresh produce output in the state accounts for 3.9 per cent of the national fresh produce total.

International exports from the Australian fresh produce sector are valued at over \$1.6 billion per year, and industry turnover is around \$7.8 billion per annum. In total, the agriculture sector accounts for approximately 14 per cent of Australia's total goods and services exports.⁶ Tasmania is a significant contributor to these international fresh produce exports, with cherries, carrots, and onions all exported internationally. Tasmania's international exports are valued at \$64.5 million per annum, which mostly comprises cherries – as the main *international* export.⁷

As a share of Australia's gross domestic product (GDP), the agriculture sector represents nearly 3 per cent of Australia's GDP. Of this, fruits, vegetables and nuts are 13 per cent, making it the second largest sub-category of agriculture, behind cattle at 16 per cent and followed by wheat at 9 per cent.⁸

However, given the short term employment of a number of fresh produce roles (particularly during peak harvest periods) and need for flexibility in working location due to the rural location of many crops, it can be difficult to source workers through domestic labour.⁹ As such, the sector is heavily reliant on temporary migrant workers to meet labour requirements in its harvest workforce. Two visa programs support this need: the Working Holiday Maker (WHM) program and the Seasonal Worker Program (SWP). Australia's participation in the SWP is not just about labour shortages. The program is also an opportunity for Australia to support nine of its Pacific neighbours with skills development, with many of the SWP participants returning to Australian farms year after year.¹⁰

1.2 Purpose

The purpose of this economic contribution and regional profile study is to demonstrate how much the Tasmanian fresh produce sector contributes to the broader economy in which it operates.

² Deloitte Access Economics, Independent stakeholder engagement on the Working Holiday Maker Visa review, 2016.

³ The Tasmanian fresh produce industry is estimated to be worth \$309.7 million, based on Australian Bureau of Statistics (ABS) gross value of production for fresh fruit and vegetables in 2018-19 (excluding processing). However this is viewed as an underestimate by industry stakeholders consulted for this report. Including processing, the total production of fruits and vegetables in Tasmania is estimated to be worth \$339.4 million. Source: Department of Primary Industry, Parks, Wildlife and Environment (DPIPWE), Tasmanian Agri-Food Scorecard, 2017-18.

⁴ Australian Bureau of Statistics Cat 7503.0 – Value of Agricultural Commodities Produced 2018-19.

⁵ Australian Bureau of Statistics, State Accounts and National Accounts, Cat. No. 5220.0 and 5206.0, 2019

⁶ Australian Bureau of Agricultural and Resource Economics, Commodity forecasts and outlook, March quarter 2019.

⁷ Hort Innovation, Australian Horticulture Statistics Handbook, 2018/19.

⁸ Australian Bureau of Agricultural and Resource Economics, Snapshot of Australian Agriculture, 2020.

⁹ Deloitte Access Economics, Independent stakeholder engagement on the Working Holiday Maker Visa review, 2016.

¹⁰ Stakeholders consulted by Deloitte noted that up to 80 per cent of SWP participants return to a farm the following year.

Despite the fresh produce sector's economic presence, growers consider that the current contribution of the industry is undervalued by the broader community– as is its ongoing potential to add to the economy through growth. This underassessment of the industry has long presented challenges, including when sourcing labour for the fresh produce sector. As such, this report notes some of the potential challenges for the sector going forward.

1.3 Structure of this report

The remainder of this report is structured as follows:

- Chapter 2 provides an overview of the Tasmanian fresh produce sector, including the value of production, trade and employment profile, and the structure of the sector in Tasmania, as well as a selection of business case studies.
- Chapter 3 discusses the model inputs, modelling methodology and results.
- Chapter 4 reflects on the implications of this study.

2 Profile of the Tasmanian Fresh produce sector

This chapter provides an overview of the Tasmanian fresh produce sector, including its size, crop types and regional analysis, alongside case studies of three Tasmanian fresh produce businesses: Costa Farms, Montague, and Simplot.

2.1 Overview of the Tasmanian fresh produce sector

The fresh produce sector is an important part of Tasmania's agriculture industry, and broader economy. Alongside other primary sectors such as the livestock sector, the fresh produce sector is an important source of export revenue, as well as generating employment and economic activity in regional areas.

Tasmania's climate is relatively consistent allowing the fresh produce sector to be resilient year-round. Its reputation for clean, high-quality produce is also proving to be an advantage for the sector, in the same way that the 'Made in Australia' brand often carries a price premium in international markets.

More recently, the State Government has announced that it will focus on agriculture, amongst other industries, as part of its COVID-19 recovery plan.¹¹

2.1.1 Volume and value of Tasmanian production

Total production of fruits and vegetables in Tasmania is worth \$339.4 million. Of this, fresh produce production (i.e. excluding processing) in Tasmania was worth \$309.7 million in 2018-19, consisting of \$177.1 million (57%) for fruit and \$132.6 million (43%) for vegetables.¹²

By weight, 41,563 tonnes of fruit were produced in Tasmania in 2017-18, up 3.8 per cent from 40,027 tonnes in 2016-17, while 511,462 tonnes of vegetables were produced in Tasmania in 2017-18, up 4.5 per cent from 489,425 in 2016-17.¹³

2.1.2 Destination for Tasmania's fresh produce

Tasmania is a net exporter of both fruits and vegetables. Consumers on the Australian mainland form the main market for Tasmanian produce, representing 71 per cent of demand, while 6 per cent is exported internationally. Tasmanians consume the remaining 23 per cent of their own produce.

Tasmanian imports \$84.8 million¹⁴ worth of fruit each year, or 58 per cent of the \$146.0 million of local consumption. Similarly, \$23.9 million, or 14 per cent of local vegetable consumption, is sourced from imports.

The most productive crops in Tasmania are berries, apples and cherries in the warmer months, and potatoes, onions and carrots in the cooler months. Given its climate, Tasmania is a major producer of these crops and exports a significant portion of each (Table 2.1).

On average, the total Tasmanian production surplus – produce over and above what local Tasmanians consume – is 80 per cent for fruit and 75 per cent for vegetables.¹⁵ In short, Tasmania is a major fresh produce supplier for Australian consumers.

¹¹ Peter Gutwein, Tasmania to build its way out of Coronavirus (15 May 2020)

<http://www.premier.tas.gov.au/releases/tasmania_to_build_its_way_forward_from_coronavirus>.

¹² Australian Bureau of Statistics Cat 7503.0 – Value of Agricultural Commodities Produced 2018-19.

¹³ Hort Innovation, Australian Horticulture Statistics Handbook 2018/19.

¹⁴ Including interstate and international.

¹⁵ Department of Primary Industry, Parks, Wildlife and Environment (DPIPWE), Tasmanian Agri-Food Scorecard, 2017-18.

Table 2.1: Production surplus by produce type, 2017-18

Produce type	Production surplus
Cherries	95%
Apples	58%
Berries	76%
Potatoes	87%
Carrots	91%
Onions	91%

Source: DPIPWE.

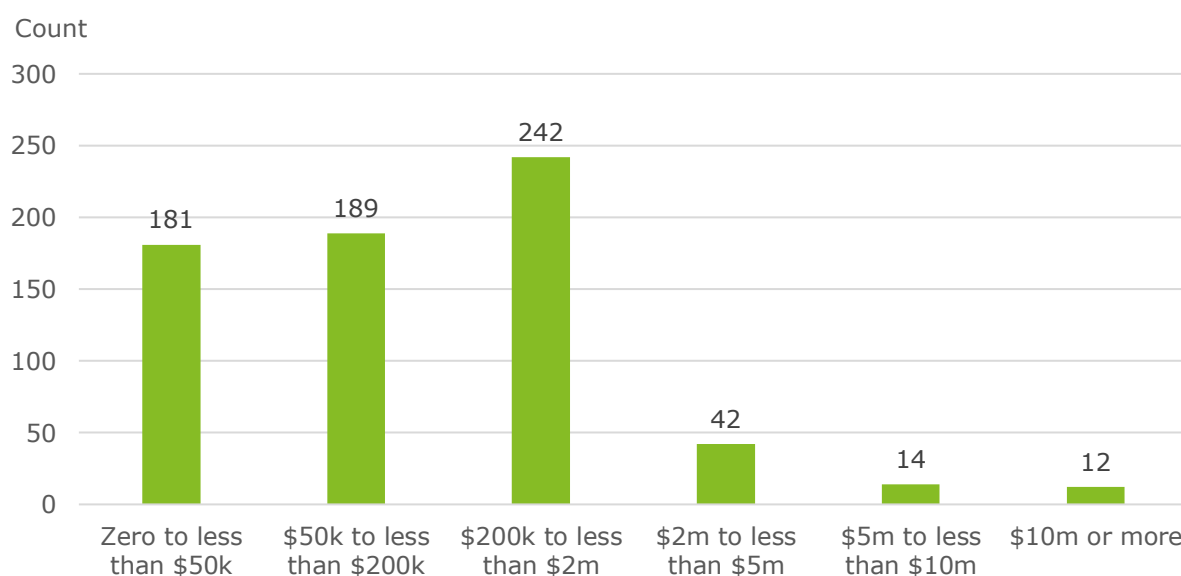
Internationally, cherries are the most valuable export of the six major crops, with \$39 million exported annually. Total international fruit exports are valued at \$40 million, with the main markets being China, Hong Kong and the United States.

International vegetable exports are just under half the value of fruit exports, at \$17.9 million annually. The primary vegetables exported are carrots and onions. France, Japan and the United Arab Emirates are the major consumers of this produce.¹⁶

2.1.3 Industry profile

The Tasmanian fresh produce industry is characterised by a number of small farms, and relatively fewer large farms. There are several hundred small farms with turnover of less than \$1 million, and a few dozen large farms with turnover of several million dollars (Chart 2.1). As a consequence, packaging and distribution of produce is often centralised to larger farms that process their own produce alongside produce from smaller farms.

Chart 2.1: Count of businesses in the Tasmanian fresh produce sector, 2018-19



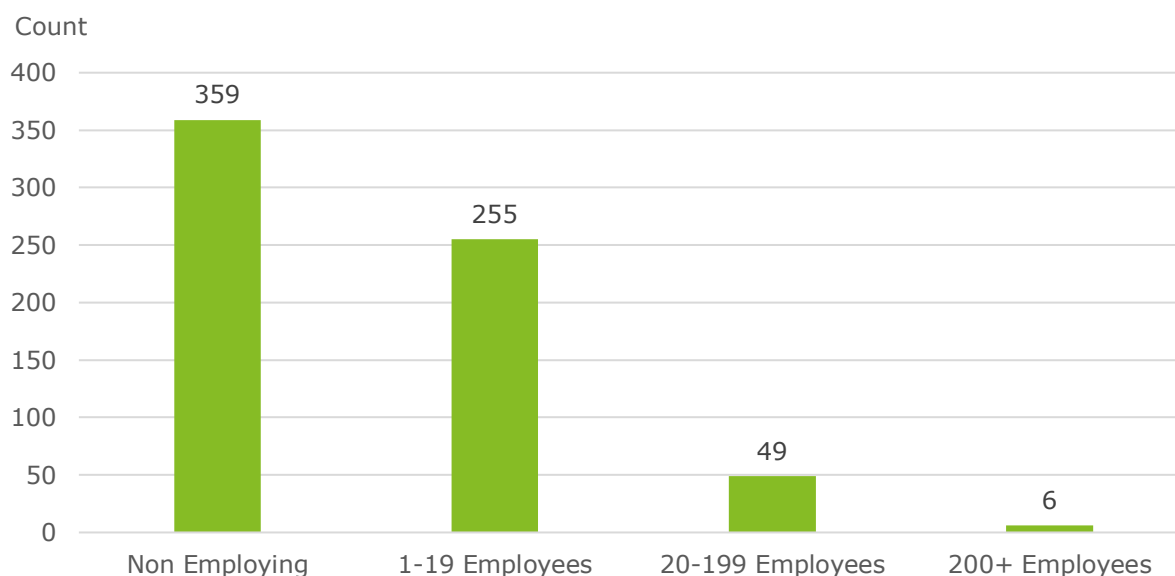
Note: Includes businesses operating at the end of the financial year in the following ANZSIC industries: Mushroom Growing, Vegetable Growing (Undercover), Vegetable Growing (Outdoors), Grape Growing, Kiwifruit Growing, Berry Fruit Growing, Apple and Pear Growing, Stone Fruit Growing.

Source: ABS Counts of Australian Business, including Entries and Exits, Cat. No. 8165.0, June 2019.

¹⁶ Ibid., 27.

This reflects an industry that is predominantly comprised of small private family businesses that do not have many, if any, official employees. In cases where the employees are all family, these businesses tend to pay their employees in profits rather than wages. According to the ABS, 614 of the 661 fresh produce businesses in Tasmania have fewer than 20 employees (Chart 2.2).

Chart 2.2: Count of businesses in the Tasmanian fresh produce sector, 2018-19



Note: Includes businesses operating at the end of the financial year in the same categories in the above chart.

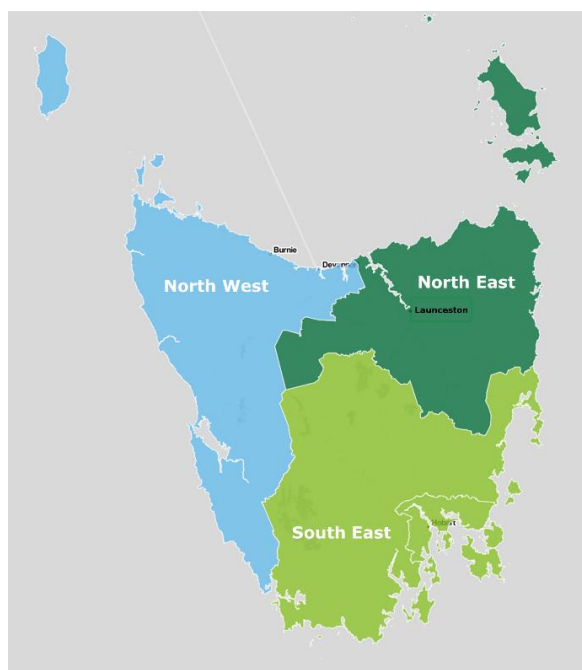
Source: ABS Counts of Australian Business, including Entries and Exits, Cat. No. 8165.0, June 2019.

2.1.4 Regional profile analysis

A variety of crops are grown across Tasmania. The climate in the south of Tasmania is more conducive to cherries, whereas the climate in the north has led to the production of other crops such as potatoes, carrots and onions.

Tasmania can be split into three key growing regions – the North West (including Devonport), the North East (including Launceston) and the South East (including Hobart). These regions are based upon ABS Statistical Area Level 4 (SA4) regions for simplicity of data analysis, with the sub-regions of Tasmania that comprise these SA4s outlined in Appendix A. These regions are mapped below:

Figure 2.1: Map of Tasmanian regions



Note: These three separate growing regions are based upon ABS Statistical Area Level 4 regions (SA4s)

Source: Australian Bureau of Statistics, Deloitte Access Economics.

The North West and North East are Tasmania's primary vegetable production areas, whereas the South East primarily produces fruit (Table 2.2).

Table 2.2: Gross value of production of fresh fruit and vegetables by region

	North West		North East		South East	
	\$ million	%	\$ million	%	\$ million	%
Fruit	50.4	46%	43.1	42%	83.5	86%
Vegetables	59.4	54%	60.7	58%	12.6	14%
Total	109.8	100%	103.8	100%	96.1	100%

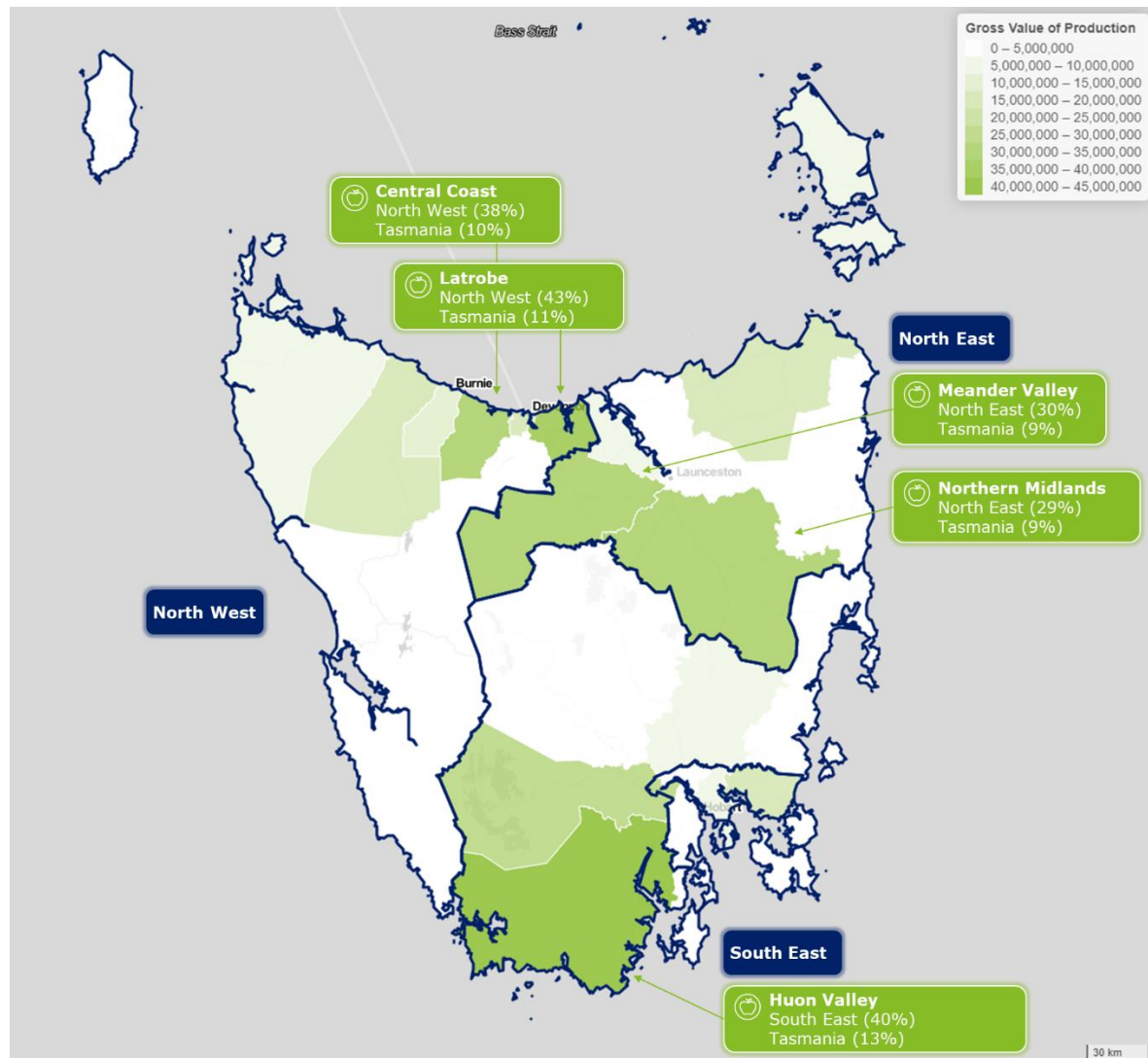
Note: As the ABS category 'potatoes' includes both fresh market and processed potatoes, the GVP value of potatoes was scaled to include only fresh market produce. This final value is included in the calculation of 'Vegetable' GVP.

Source: Australian Bureau of Statistics Cat. 7503.0 – Value of Agricultural Commodities Produced, 2018-19, Deloitte Access Economics.

Across these three regions, there are five key sub-regions that are responsible for more than 50 percent of Tasmania's fresh produce gross value of production ('GVP'). These sub-regions – defined by ABS Local Government Areas (LGAs) – are mapped below (Figure 2.1). The three regions, and their main crops, are explored in more detail in the sub-sections below.¹⁷

¹⁷ See Appendix A for full list of Local Government Areas that comprise these three regions.

Figure 2.1 Distribution of Tasmanian fresh produce value of production of by LGA, 2015-16



Note: (1) The region 'South East' includes the ABS Statistical level areas of South East and Hobart. (2) The full list of SA4s and LGAs that make up these three sub-regions is provided in Appendix A.

Source: Australian Bureau of Statistics Cat. 7503.0 – Value of Agricultural Commodities Produced, 2015-16, Deloitte Access Economics.

2.1.4.2 North West

In the North West, fruit and vegetable production is concentrated in two LGAs adjacent to the City of Devonport. The LGAs of Latrobe and the Central Coast respectively make up 43 and 38 percent of the region's fruit and vegetable production (Figure 2.1). The two regions produce the second and third highest value of fruit and vegetable production in Tasmania by GVP (at the LGA level).

Despite fruits and vegetables earning similar production values in GVP terms, the total land area used for vegetable production is more than 14 times that of the region's fruit production (5,214 ha versus 372 ha). This figure corresponds with volume of vegetable growing businesses – 90 per cent of the 209 fruit and vegetable businesses in the North West region produce vegetables as their main crop.

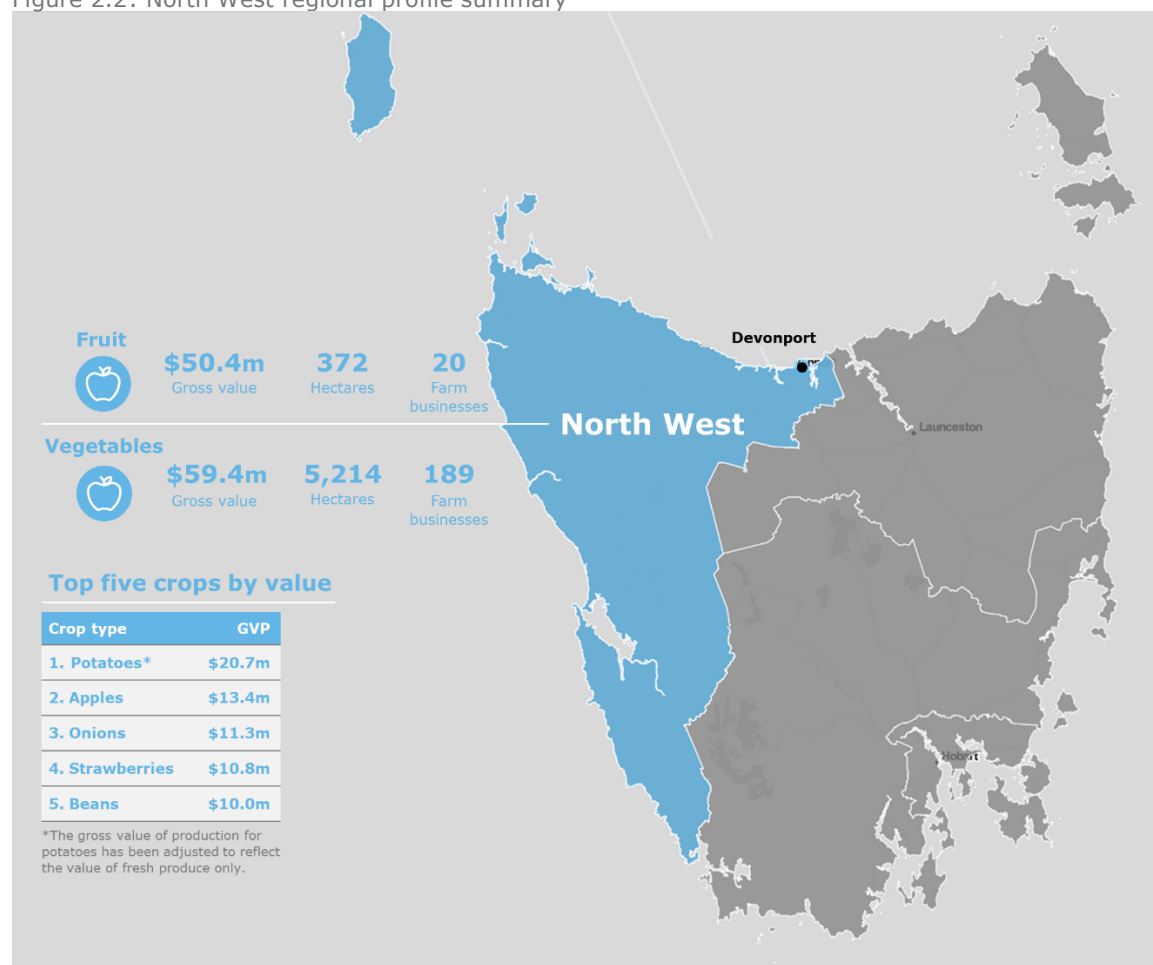
Little to no production occurs in the south of the North West region due to mountainous terrain including the West Coast Range, the Arthur Range and the Stitches Range.

In addition to growing, the North West region is a major processing hub, home to three of the four Tasmanian vegetable processors. Many of the region's growers supply both the fresh produce market and the processing market.

Potatoes make up the highest proportion of the region's GVP of all vegetables and fruit, at 45 percent. In 2018-19, \$65 million worth of potatoes were produced – six times the value of onions, the second highest vegetable in terms of GVP. While a significant proportion of potatoes are produced in the North East region (an additional \$60 million in GVP terms), the North West produced the highest value of potatoes in 2018-19. However, only 32 per cent of potatoes produced in Tasmania are for immediate consumption (valued at \$20.7 million, as shown in Figure 2.2), with the remaining 68 per cent going to further food processing (so excluded from this study).¹⁸

In comparison, 'other fruit' (including berries other than strawberries), and apples were the highest value fruit produced in 2018-19 for the region, at \$22 million and \$13 million respectively.

Figure 2.2: North West regional profile summary



Source: Australian Bureau of Statistics Cat 7503.0 – Value of Agricultural Commodities Produced 2018-19; Tasmanian Agri - Food scorecard 2018-19; Deloitte Access Economics.

The below case studies of Costa Farms and Simplot highlight the key activities undertaken by berry and potato producers in the North West that contribute to the local economy.

¹⁸ Hort Innovation, Australian Horticulture Statistics Handbook, 2018/19, Vegetables 390.

Case study 2.1 Costa farms

Costa Berries



Costa is an Australian fresh produce business with significant berry growing operations in Tasmania.

Costa has an estimated 230 hectares of farmland in Tasmania, on which it grows blueberries, raspberries, blackberries and strawberries. Tasmania is the only location where Costa grows all four of the main berry varieties and it is integral to Costa's capacity to supply both blueberries and raspberries for 52 weeks of the year. The Tasmanian farms are in the north of the state, including East Devonport, Wesley Vale, Nine Mile, Dunorlan and Lebrina. Costa also operate a warehouse and distribution centre at East Devonport, including a Modified Atmosphere Facility in which it can cold store berries at a constant temperature for up to eight weeks at a time.

Costa has between 150 and 200 year around employees across its Tasmanian operations, with most of these workers local Tasmanians. During harvest, employment can peak at 1600, with a total of 2000 casual workers engaged during the November to April harvest season. Costa endeavour to use as much local labour that is available for the harvest season and in many cases these entry points provide career opportunities to the Tasmanian workforce in the horticultural industry and related sectors. The harvest season labour workforce is supplemented by working holiday makers (backpackers) and Pacific Islanders who are employed as part of the Australian Government's Seasonal Worker Program. This provides a mutual benefit to the Australian horticultural industry and Pacific Island nations as part of Australia's foreign aid effort. Approximately a third of the harvest workers (550) are Pacific Islanders, employed as part of the Seasonal Worker Program (SWP). The SWP allows participants to work for up to 6 months in a year in the Australian fresh produce sector. As there are no limits on how many years a worker can participate in the program Costa has formed lasting relationships with many of these workers. This allows Costa to offer repeat work, meaning the SWP participants can build on their experience. Given this, approximately 70-80 per cent of SWP workers return to Costa the next year, with some workers returning for up to 7 years.

The working holiday and SWP workforce are accommodated in North and North West Tasmania leading to a significant local economic contribution to the goods and services sectors. There is also economic activity and employment associated with non-harvest activities on Costa's farms. The development of Costa's Tasmanian farms requires significant investment and skilled labour, much of which is sourced in-house or locally. These roles include horticulturalists and machinery operators. Costa utilises local suppliers where possible for items such as machinery, contractors and fertiliser, further adding to the Tasmanian economy. Other stakeholders have noted that North-West Tasmania is well established in terms of support services for the horticulture sector. As such, several local businesses in the region provide services to farms such as those operated by Costa, as well as handling some retail and administrative aspects of operations. It is likely that these support services would be smaller in Tasmania's north if there was not an established horticulture industry underpinned by large farms such as Costa.

Case study 2.2: Simplot

Simplot



Simplot is one of Australia's largest food manufacturing and agricultural companies, with vegetable processing facilities located in Tasmania's Devonport and Ulverstone in the north of the State. Simplot Australia is the last remaining manufacturer of Australian-grown frozen and shelf-stable vegetables. While Simplot does not grow fresh produce in Tasmania, it is one of the state's largest 'consumers' of Tasmanian fresh vegetables, helping to underpin demand in the industry.

The Devonport facility employs over 300 people and processes over 60,000 tonnes of vegetables every year, including carrots, cauliflower, beans, peas and broccoli. These products are predominately sold in supermarkets under the Birds Eye and Edgell frozen vegetable brands, and in Coles' supermarkets under the Coles brand. It is estimated that the majority of this fresh produce is sourced from local Tasmanian farms, while some produce is sourced from the Australian mainland.

The Ulverstone facility employs 340 people and every year processes over 300,000 tonnes of potatoes, primarily into French fries, and sold to Simplot's retail and foodservice customers. The potatoes are sourced from over 165 local growers. The Ulverstone plant secured a \$12 million government grant in April 2019 to expand its operations.¹⁹

Simplot also has a vegetable processing facility in Bathurst, New South Wales.

2.1.4.3 North East

Most fruit and vegetable production in the North East region occurs in the southern part of the region. The LGAs of Meander Valley and Northern Midlands respectively make up 30 and 29 per cent of the Launceston and North East region's production in GVP terms.

Combined, these LGAs contribute nearly a fifth of Tasmania's total fruit and vegetable produce, or 9 percent each in GVP terms.

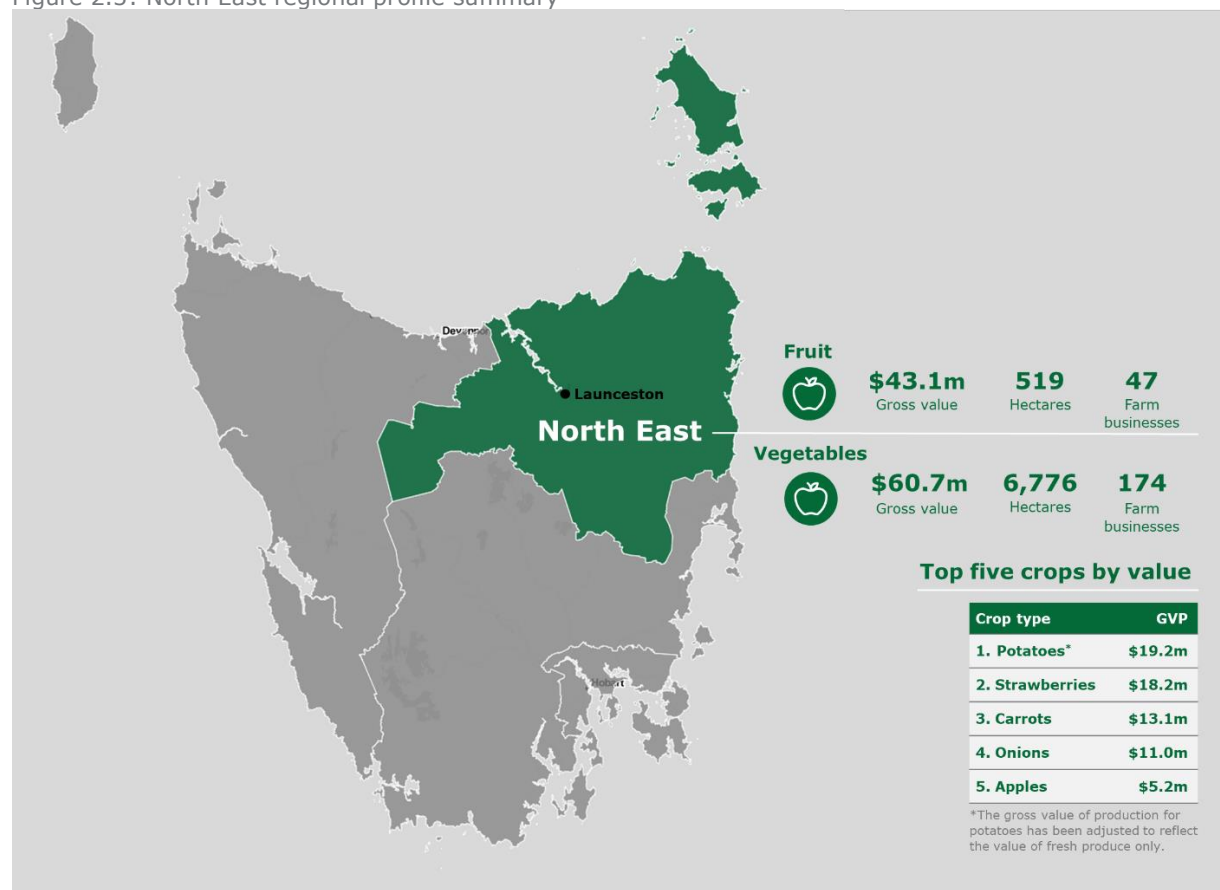
Similar to the North West region, the North East is primarily a vegetable producing region. In 2017-18, more than 6,700 hectares of land was used for vegetable production, 13 times the amount of land used for fruit production. Of the 221 fruit and vegetable businesses in the North East region, 174 (or around 80 percent) produce vegetables as their main crop type. Compared to the North West, there are fewer vegetable farmers, but the larger total land area for vegetable production suggests farmers in this region operate relatively larger farms.

Again, potatoes contribute the most to the region's GVP of all fresh vegetables and fruit, at 18 percent of GVP (valued at \$19.2 million in 2018-19). Carrots (\$13.1 million) and onions (\$11.0 million) are the second and third highest value vegetables by GVP.

Strawberries and 'other fruit' (including berries other than strawberries) were the region's highest value fruit produced in 2018-19. These fruits, valued at \$18 million and \$15 million respectively, make up almost half the region's fruit production in GVP terms.

¹⁹ Simplot Australia, 'News', *\$12 Million Grant Secures A Bright Future For Simplot's Ulverstone Potato Plant* (3 April 2019) <<https://www.simplot.com.au/news/news-articles/12-million-grant-secures-a-bright-future-for-simplot-s-ulverstone-potato-plant/>>.

Figure 2.3: North East regional profile summary



Source: Australian Bureau of Statistics Cat 7503.0 – Value of Agricultural Commodities Produced 2018-19; Tasmanian Agri - Food scorecard 2018-19; Deloitte Access Economics.

2.1.4.4 South East

Most fruit and vegetable production in the South East region occurs in the southern part of the region. The Huon Valley is the largest fruit and vegetable producing area in South East, and Tasmania more broadly. In total, the Huon Valley makes up 40 per cent of the South East's fruit and vegetable GVP, and 13 percent of Tasmania's fruit and vegetable GVP. In comparison, the second highest area of production in the South East, the Derwent Valley, only makes up 24 percent of the South East's fruit and vegetable GVP.

Unlike the other two regions, the South East is predominately a fruit producing region. In 2017-18, 1,900 hectares of land were used for fruit production, four times the amount of land used for vegetable production. Of the 134 fruit and vegetable businesses in the South East region, 101 (or 75 percent) produce fruit as their main produce.

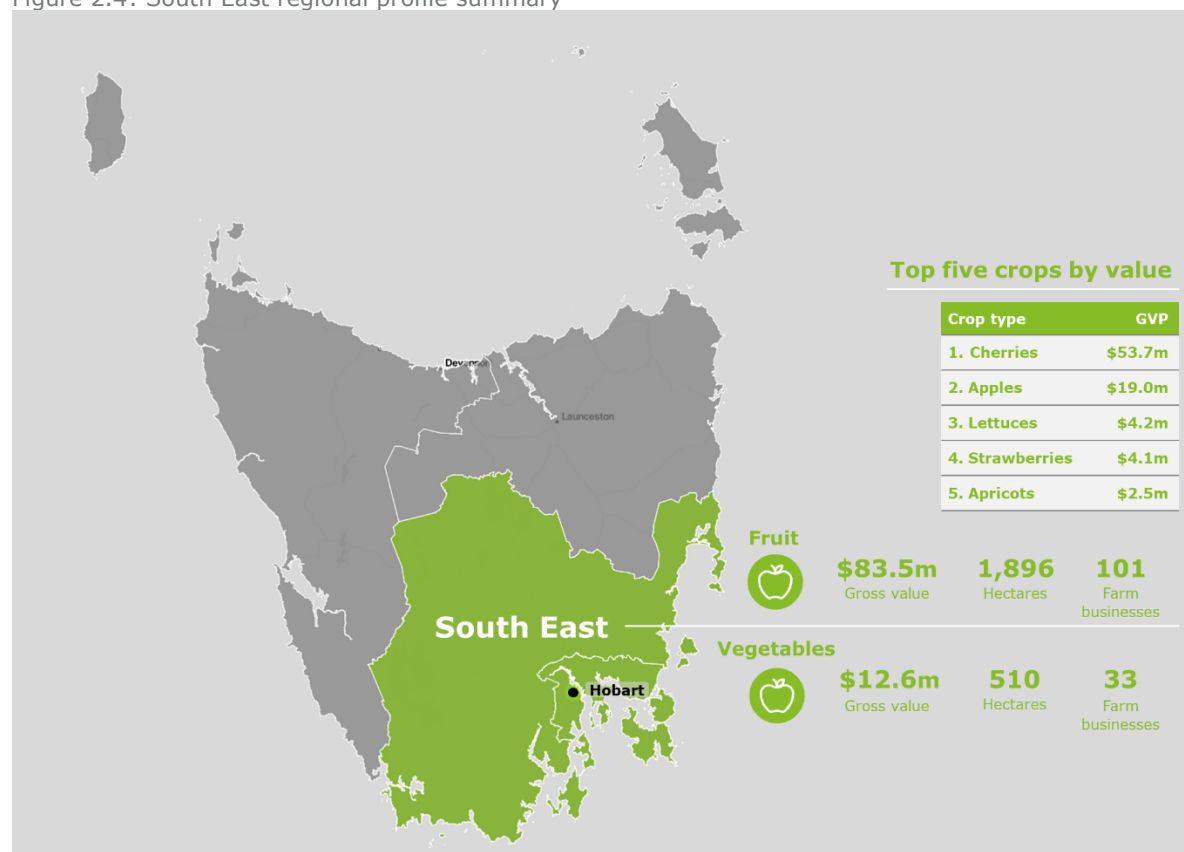
While a greater proportion of land is used for fruit production than for vegetable production in the South East, the total value of fruit compared to vegetable production is much greater. This is because the main crop produced, cherries, is high value. For example, the wholesale value of one kilogram of cherries was eight times the value of one kilogram of potatoes in 2018-19, at \$20.81 (compared to \$2.50).²⁰

The South East region is also the dominant region of cherry production in Tasmania. The total value of cherries is around 10 times higher than the North West and North East regions, in GVP terms.

²⁰ Rural Bank (2018), Australian Horticulture Annual Review. Available at: <https://www.ruralbank.com.au/siteassets/_documents/publications/horticulture/hort-annual-review-2018.pdf>; Stakeholder consultation 9 September 2020, Cherry Growers Australia.

The value of cherry production in the South East is also significant compared to other fruit in the region. In 2018-19, \$53.7 million of cherries was produced in the South East, three times the value of apples - the second highest value fruit in terms of GVP. Moreover, vegetable production only contributes \$12.6 million (14 percent) to the South East's fresh produce GVP, with lettuce – the highest value vegetable in GVP terms – contributing \$4.2 million to the South East's fresh produce GVP.

Figure 2.4: South East regional profile summary



Source: Australian Bureau of Statistics Cat 7503.0 – Value of Agricultural Commodities Produced 2018-19; Tasmanian Agri - Food scorecard 2018-19; Deloitte Access Economics.

The case study of Montague Fresh below highlights the key activities undertaken by a fruit producer in the South East that contributes to the local economy.

Case study 2.3 Montague Fresh

Montague Fresh

Montague Fresh is an Australian fresh produce business that grows apples, cherries and pears in Tasmania.

Montague grows some produce directly, as well as licencing out cultivars, such as the Jazz and Envy Apple brands, to other growers in the state. By giving Apple growers access to cultivars and Montague's associated growing expertise, Montague increases the number of crops that are able to be grown in Tasmania, as crops suitable for Tasmania's climate might not otherwise be available to the state.

On its own farms, Montague has a handful of permanent employees working year-round, and a casual workforce that conducts on farm activity including pruning in the spring and harvesting in

late February to April. The majority of Montague's casual workers are sourced from a pool of WHM Visa holders, but locals are also given opportunities.

In 2017, Montague undertook a large replanting program, covering around one-quarter of its orchards. This program drew on local machinery and workers during the development phase, followed by further activity during the pruning phase. The program is beginning to yield produce in 2020, but the main economic benefits of the investment to Tasmania will not be seen until around 2025, when the crop matures and output peaks.

3 Economic contribution of Tasmanian fresh produce

This chapter presents the economic contribution of Tasmania's fresh produce sector to the economy. It includes an overview of the modelling approach, the inputs to the modelling and the modelling results.

3.1 Economic contribution modelling

Economic contribution – or value added – represents an industry's unique contribution to the economy by capturing the value of its production and labour, excluding the cost of goods. In other words, it represents an industry's revenue exclusive of its non-labour input costs. The sum of all industries' value added across the economy is GDP.

3.1.1 Methodology

Economic contribution modelling, also known as input output modelling, utilises real industry data from a series of national data tables called input output tables. These tables provide the estimated value added of each sector in the Australian economy, as well as the trade linkages between sectors. They are produced by the Australian Bureau of Statistics²¹ (ABS).

The **direct economic contribution of Tasmania's fresh produce sector is measured by its value added to the economy arising from its activities**. This includes the activity associated with growing and harvesting crops. Direct value added is the preferred measure of economic value as the calculation avoids the double counting that can arise when using measures such as the value of output or sales revenue. This is because these measures include the value of intermediate inputs that are actually the product of another sector, and so would be counted as the upstream industry's value added.

Meanwhile, indirect economic contribution, or **indirect value added, captures the goods and services produced in up-stream sectors as a result of demand generated by the Tasmanian fresh produce sector**. Indirect value added captures economic activity associated with inputs, such as fertiliser production, farm machinery and other farm inputs such as strawberry runners and tunnels.

Total economic contribution is measured by adding the direct and indirect economic contribution, with this study capturing the activities of Tasmanian growers of fresh produce that is destined for immediate consumption (and not processing).

Specifically, the economic contribution of berries, cherries, apples and vegetables is presented due to the availability of data.

Notably economic contribution studies cannot be used to infer how much bigger or smaller the Tasmanian economy is as a result of this activity as resources would be reallocated in the economy if this activity did not exist. Further detail on the methodology can be found in Appendix A.

3.1.2 Inputs

The inputs to the economic contribution modelling are based on detailed financial data provided by 16 Tasmanian fresh produce growers via an industry survey. This data was then considered in the context of information obtained during follow-up consultations with industry stakeholders and desktop research conducted by Deloitte to develop the final model inputs.

The key model inputs for economic contribution modelling are total industry revenue, total industry wage expenditure, total industry expenditure on intermediate goods and services and

²¹ Australian Bureau of Statistics, 5209.0.55.001 *Australian National Accounts: Input-Output Tables, 2016-17*, Released 27 June 2019, <<https://www.abs.gov.au/ausstats/abs@.nsf/mf/5209.0.55.001>>.

full-time equivalent employees (FTE). Where total industry revenue has not been provided, we have used gross value of production data provided by the ABS as a proxy for revenue. While it is acknowledged that this is not a perfect match, for primary industries this value tends to be relatively close to industry revenue, so is used here where revenue data is lacking.

The data that has been gathered is outlined in Table 3.1 across the four crop types analysed in this report: berries, apples, cherries and vegetables.

Table 3.1 Data sources for contribution study inputs by fruit and vegetable crop type

Input item	Value	Source
Berries		
Revenue (\$ million)	200.0	Berry industry revenue was collected based on survey data for eight berry growers. These growers are estimated to represent approximately 75 percent of the market share for berries. This is based on estimates of market share provided by individual businesses, which were sense-checked with two industry peak bodies. ²² This total industry revenue figure was then scaled to account for those businesses for which there was no data. ²³
Intermediate inputs (\$ million)	74.7	Detailed expenditure data on intermediate inputs was provided by approximately 30 percent of the berry industry respondents. An average of this breakdown of industry expenditure was then used to impute expenditure figures for the other berry survey respondents that did not provide this data and the remainder of the industry for which revenue was estimated.
Wages (\$ million)	90.6	Wage and salary expenditure provided by survey respondents was used as the basis to impute a total industry wage figure to account for those businesses that did not provide data.
FTE	1,356	Data provided by survey respondents was combined with de-identified survey data provided by Fruit Growers Tasmania to estimate a total industry employment figure.
Apples¹		
Revenue (\$ million)	49.7	Apple industry revenue was collected from approximately 10 percent of the Tasmanian apple industry. This market share was estimated using survey data, and then scaled to capture the growers that did not provided data. The final revenue estimate was corroborated during stakeholder consultations and benchmarked against the gross value of production for Tasmanian apples. ²⁴
Intermediate inputs (\$ million)	21.0	Detailed expenditure of intermediate inputs was collected for approximately 10 percent of the apple industry. This provided an estimation of the breakdown of total expenditure for the industry that was validated in consultation with stakeholders and then used to impute a total expenditure figure for intermediate inputs. ²⁵
Wages (\$ million)	16.2	Expenditure on wages and salary was provided by survey respondents and scaled to account for the remainder of the industry for which data was not directly collected.
FTE	310	The estimated number of workers in the apple industry was estimated based on de-identified labour data from Fruit Growers Tasmania and information provided during consultations.
Cherries		
Revenue (\$ million)	62.8	Cherry industry revenue data was not provided in survey responses. As such, gross value of production is used as a proxy for revenue. ²⁶ The use of this figure was validated as a conservative but suitable proxy in consultation with Cherry Growers Australia and Fruit Growers Tasmania. This figure was also confirmed as a reasonable estimate by back solving

²² Australian Fresh Produce Alliance and Fruit Growers Tasmania.

²³ Revenue was scaled by a factor of 1.3.

²⁴ The revenue scaling factor was 10.

²⁵ Intermediate input expenditure was scaled by a factor of 10.

²⁶ Australian Bureau of Statistics Cat. 7503.0 – Value of Agricultural Commodities Produced, 2018-19, Deloitte.

Input item	Value	Source
		from the estimated share of employment provided in consultation with Fruit Growers Tasmania.
Intermediate inputs (\$ million)	25.5	Detailed expenditure on intermediate inputs was not provided in survey responses for the cherry industry. As such, the total expenditure breakdown represents an average estimate based on survey data provided by the fruit producers, combined with proportional breakdown of key intermediate inputs from consultation with Cherry Growers Australia.
Wages (\$ million)	15.8	Employment expenditure was estimated to make up around 35 per cent of total expenditure, confirmed in consultation with Cherry Growers Australia.
FTE	336	The estimated number of workers in the cherry industry was estimated based on de-identified labour data from Fruit Growers Tasmania and information provided during consultations.
Vegetables		
Revenue (\$ million)	145.6	Vegetable industry revenue in dollar terms was provided by survey respondents for less than 10 percent of the vegetable industry and was insufficient to extrapolate to the total industry. For this reason, gross value of production of fresh vegetable produce is instead used as a proxy for industry revenue and was validated with key industry stakeholders. ²⁷
Intermediate inputs (\$ million)	66.8	Detailed expenditure of intermediate inputs was not provided in survey responses for the vegetable industry. Total expenditure and the subsequent breakdown of intermediate inputs was estimated based on total fresh produce survey data, combined with proportional breakdown of key intermediate inputs from consultation with key industry stakeholders.
Wages (\$ million)	39.5	Employment expenditure was estimated to make up around 30 per cent of total expenditure based on survey responses and confirmed in consultation with key industry stakeholders.
FTE	706	Industry FTE was calculated based on total employment expenditure.

Notes: (1) FTE data collected for the apple industry includes other pome fruit, such as pears, however the revenue data provided is from an apple grower.

Based on the above breakdown by crop type, total industry revenue across these four fresh produce crop types in 2018-19 was estimated to be \$458.1 million, expenditure on wages was approximately \$162.1 million – 35 per cent percent of total revenue – while \$188.0 million was estimated to be spent on intermediate inputs by the industry. These inputs were predominately purchased from the following upstream sectors:

- Freight and logistics to packing and storage in Tasmania, as well as shipping costs to send freight to the mainland
- Farm inputs such as fertiliser, chemicals, seeds and packaging
- Repairs and maintenance
- Water and utilities (including gas and electricity)
- Regulation and compliance such as food and farm safety audits.

Notably, expenditure patterns differed across the fresh produce sectors for key inputs. Freight and logistics expenditure as a proportion of total expenditure is higher for more perishable crop types, such as berries and cherries, compared to crop types that typically store well including apples and vegetables. Freight and logistics spend is particularly high for the cherry industry, which caters to a significant export market, at 35 percent of total expenditure (outlined in section 2.1.2), reflecting the fact that cherries are on average freighted further than other Tasmanian crops, which only go to the mainland.

²⁷ Australian Bureau of Statistics Cat Australian Bureau of Statistics Cat. 7503.0 – Value of Agricultural Commodities Produced, 2018-19; Deloitte.

Despite this higher average freight expenditure across fruits, the higher retail price paid for these fruits (and indeed the premium paid for Tasmanian cherries compared to Australian mainland cherries) means that fruit growers are better able to absorb these high freight costs compared to vegetable growers.

Conversely, farm input expenditure as a proportion of total expenditure does not appear to vary by crop type, rather, by size of the producer. While farm input expenditure ranges between 15 and 35 percent of total expenditure, farm inputs make up a greater share of total expenditure for smaller producers (who make up less than 10 percent of the market) compared to larger producers (who make up more than 25 percent of the market). This reflects the fact that larger businesses can more easily spread expensive overheads over their business.

Larger producers are also able to service larger markets including those on the mainland, reflected in the relatively higher spend on freight and logistics compared to farm inputs. Smaller producers tend to service the local markets and have a lower freight cost (on average).

Estimated FTE and salary expenditure for the combined fruit categories is almost double that of vegetables in Tasmania (Table 3.1). Vegetable production is more highly mechanised than fruit production and therefore requires fewer workers.

3.2 Modelling results: contribution to the Tasmanian economy

The results of the economic contribution modelling indicate that Tasmania's fresh produce sector **directly contributed \$270.0 million to Gross State Product (GSP) in 2018-19**. This value added represents the industry's unique contribution to the economy – that is, the growth of fresh produce using the land, labour, machinery and knowledge to convert farm inputs.

In terms of employment, the Tasmanian fresh produce sector **directly employed 2,708 full-time equivalent workers (FTEs)** in 2018-19. These workers were employed in roles including picking, packing and farm management.

Growers also purchase inputs from up-stream firms that are located in Tasmania and on the Australian mainland.²⁸ The activity of these Tasmanian businesses that occurs as a result of demand from Tasmania's fresh produce growers is considered the sector's indirect contribution. For **Tasmanian businesses this indirect contribution totalled an estimated \$66.7 million in 2018-19 to the Tasmanian economy**. This activity includes making and distributing packaging for harvested fresh produce, providing water and electricity, providing professional scientific and technical services. **This activity also supported an estimated 349 indirect FTEs.**

Together, the direct and indirect contribution to Tasmania's economy totals \$336.7 million and represents approximately 11 per cent of total agricultural value added, and 1.1 per cent of Tasmania's economy. The breakdown between the direct and indirect contribution in Tasmania's economy is shown in the table below. This analysis does not consider the impact of downstream sectors including logistics, retail and food service, nor the impact of the indirect contribution to the Australian mainland economy.

Table 3.2: Economic contribution of the Tasmanian fresh produce sector in 2018-19

Activity	Direct contribution	Indirect contribution	Total contribution
<i>Value added (\$m)</i>	\$270.0	\$66.7	\$336.7
<i>Employment (FTEs)</i>	2,708	349	3057

Source: Deloitte Access Economics

²⁸ Purchases of inputs from mainland Australian businesses also contributes to Australia's national economy, and totalled \$91 million in expenditure, however this activity is not considered here for the purposes of indirect contribution as this report is focused on the contribution to Tasmania's state economy.

Because fresh produce is a primary industry that grows from the land, it uses relatively few inputs from other sectors to produce its outputs, so has a relatively small indirect value added compared to other industries in the economy, but a **comparatively large direct value added**.

Of the sectors that the fresh produce industry does source inputs from, Transport support services and storage, and Agriculture, forestry and fishing support services benefit the most through this indirect activity – see Table 3.3 below.

Table 3.3: Share of indirect value added of the Tasmanian fresh produce sector

Sector	Indirect value added (\$ million)	Indirect employment (FTE)
Transport Support services and storage	\$20.7m	91.2
Farm inputs ¹	\$10.2m	69.1
Non-Residential Property Operators and Real Estate Services	\$4.9m	13.0
Other Repair and Maintenance	\$4.5m	19.0
Professional, Scientific and Technical Services	\$2.7m	18.2

Note: (1) 'Farm inputs' captures the ABS industry category *Agriculture, forestry and fishing support services*, but has been relabelled here for clarity.

Source: Deloitte Access Economics

The Transport Support Services and Storage sector has a large indirect value added due to the high freight costs associated with exporting fresh produce from Tasmania. Sea freight is the main route to export crops from Tasmania as airfreight is far too costly for the weight and volume of most fresh produce. The *Spirit of Tasmania* is the only sea freight service for fresh produce. Cargo space is often limited for fresh produce exporters, with passengers taking priority. Some stakeholders noted that securing transit on the ship can be competitive, with crops that can afford to pay a price premium (such as berries) more likely to secure passage. Replacements for the '*Spirits*', which are expected to have greater passenger and cargo capacity, are unlikely to be in place before 2023 (at the earliest).²⁹

The Agriculture, forestry and fishing support services sector also has a large indirect value added. Fresh produce growers purchase farm inputs from this sector including fertiliser, tractors, berry tunnels and other farm equipment to support their growing activities.

²⁹ Lucy MacDonald, 'Spirit of Tasmania replacement ferries could be built in Australia', The Mercury (online, 21 July 2020) <<https://www.abc.net.au/news/2020-07-21/spirit-of-tasmania-ferries-could-be-built-in-australia-jobs/12476538>>.

4 Implications of this study

The Tasmanian fresh produce sector is an important sector in the Tasmanian economy, particularly for the regional communities in which it operates. The sector predominately contributes to these regional communities through local employment opportunities, including supporting significant full-time, ongoing roles. These jobs are generally higher skilled and include roles such as quality assurance, agronomy, or sales and administration.

Critical to continuing full-time employment in skilled roles is the harvest workforce. Harvest roles in the fresh produce sector are often seasonal. For example, harvest roles in the cherry industry – Tasmania’s most valuable international fruit export – last just 12 weeks at the peak.

The seasonal nature of harvest work presents ongoing challenges sourcing labour locally, with the recent COVID-19 pandemic amplifying many of these challenges as border closures further reduced the available workforce. The sector relies on workers, often temporary migrants, moving from mainland Australia to Tasmania to undertake harvest work. Historically, those moving to Tasmania for harvest work have been working holiday makers or backpackers. Despite the workforce challenges, these workers – particularly backpackers – spend money across Tasmania including on accommodation, food and beverage, and other tourist activities.

The fresh produce industry in Tasmania also adds significant value to the freight and logistics sector, due to requirements of shipping fresh produce in a timely and efficient manner both intra and inter-state.

Access to timely and affordable freight is a significant issue facing the sector – and its competitiveness relative to growers on mainland Australia. Compared to the mainland horticulture industry, freight and logistics make up a much more significant portion of costs for Tasmanian producers. The vast majority of Tasmanian produce is shipped via sea to the mainland for both interstate and international exports. This is done at a higher price per kilometre than road freight, which is used by producers on the mainland.

It is estimated that the average cost of shipping from Tasmania to the mainland is 16.34 cents per net-tonne kilometre (c/ntkm), compared with 3.99 c/ntkm for rail and 2.90 c/ntkm for interstate road shipping.³⁰ This means that the cost of shipping fresh produce from Devonport to Melbourne (not including getting the produce to Devonport) is \$73.04 per tonne, compared with \$13.11 per tonne from Melbourne to Wagga Wagga via road (a similar distance).

The problem is exacerbated for vegetables due both to the heavier weight for a given volume compared to fruit, and the typically lower retail price. Vegetable growers consulted as part of this study reported being ‘bumped’ from the Spirit of Tasmania to make room for higher paying fruit – or passengers. Because fresh produce needs to be freighted quickly to maintain freshness, the current freight cost and access challenges can increase the risk of crops spoiling.

In acknowledgement of this competitive challenge, the Tasmanian Freight Equalisation Scheme (TFES)³¹ provides financial assistance to shippers based on the difference between sea freight costs and the notional costs of moving the same goods by road. However, the experience of some growers in Tasmania is that the price they are paying for freight is still significantly higher than similar length journeys on the mainland and overseas.

The Farm inputs³² sector also has a large indirect value added. Fresh produce growers purchase farm inputs from this sector including fertiliser, tractors, berry tunnels and other farm equipment

³⁰ Bureau of Infrastructure, Transport and Regional Economies (2017), *Freight Rates in Australia*.

³¹ Department of Infrastructure, Transport, Regional Development and Communications, Tasmanian Freight Equalisation Scheme, <https://www.infrastructure.gov.au/maritime/tasmanian-transport-schemes/tasmanian/>

³² ‘Farm inputs’ captures the ABS industry category *Agriculture, forestry and fishing support services*

to support their growing activities. If the fresh produce sector in Tasmania were to expand, it is expected that this sector would be a significant benefactor.

Lastly, Tasmanians consume nearly a quarter of their own produce (23%), with the majority of the remaining balance of production being supplied to mainland Australian consumers. Access to fresh – and affordable – produce encourages the consumption of fruits and vegetables.³³ With only 1 in 20 Australian adults currently meeting the recommended guidelines for consumption of fruit and vegetables³⁴, an increase in consumption of just 10% could reduce Australia's overall health expenditure by nearly \$100 million,³⁵ while also supporting the fresh produce sector and the upstream industries that supply inputs to this sector.

Overall, the implication of these relatively high freight costs, limited capacity and access to consumers and markets, along with labour shortages, is that some Tasmanian producers spoken to during consultations indicated that they are hesitant to further expand production. This is in spite of having land and capital spare, due to concerns around the ability to export crops profitably before quality diminishes and accessing labour to harvest crops before they spoil.

³³ Deloitte Access Economics, *The impact of increasing vegetable consumption on health expenditure* (report commissioned by Hort Innovation Australia, July 2016), <<https://www2.deloitte.com/content/dam/Deloitte/au/Documents/Economics/deloitte-au-economics-increasing-vegetable-consumption-health-expenditure-impact-040716.pdf>>.

³⁴ Australian Bureau of Statistics, *National Health Survey: First results, 2017-18* (<<https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey-first-results/latest-release>>, 12 December 2018).

³⁵ In 2015-16 terms;

Source: Deloitte Access Economics, *The impact of increasing vegetable consumption on health expenditure* (report commissioned by Hort Innovation Australia, July 2016), <<https://www2.deloitte.com/content/dam/Deloitte/au/Documents/Economics/deloitte-au-economics-increasing-vegetable-consumption-health-expenditure-impact-040716.pdf>>.

Appendix A Tasmanian regions

Region	ABS SA4 region	LGA
North West	North and North West	Burnie
		West Coast
		Waratah/Wynyard
		Kentish
		Central Coast
		Circular Head
		King Island
		Devonport
		Latrobe
North East	East and North East	Launceston
		Meander Valley
		Northern Midlands
		Break O'Day
		Dorset
		West Tamar
		George Town
South East	South East	Huon Valley
		Derwent Valley
	Hobart	Central Highlands
		Southern Midlands
		Glamorgan/Spring Bay
		Sorell
		Brighton
		Glenorchy
		Hobart
		Kingborough
		Tasman
		Clarence

Appendix B Economic contribution studies

Economic contribution studies are intended to quantify measures such as value added, exports, imports and employment associated with a given industry or firm, in an historical reference year. The economic contribution is a measure of the value of production by a firm or industry.

B.1. Value added

Value added is the most appropriate measure of an industry's/company's economic contribution to gross domestic product (GDP) at the national level, or gross state product (GSP) at the state level.

The value added of each industry in the value chain can be added without the risk of double counting across industries caused by including the value added by other industries earlier in the production chain.

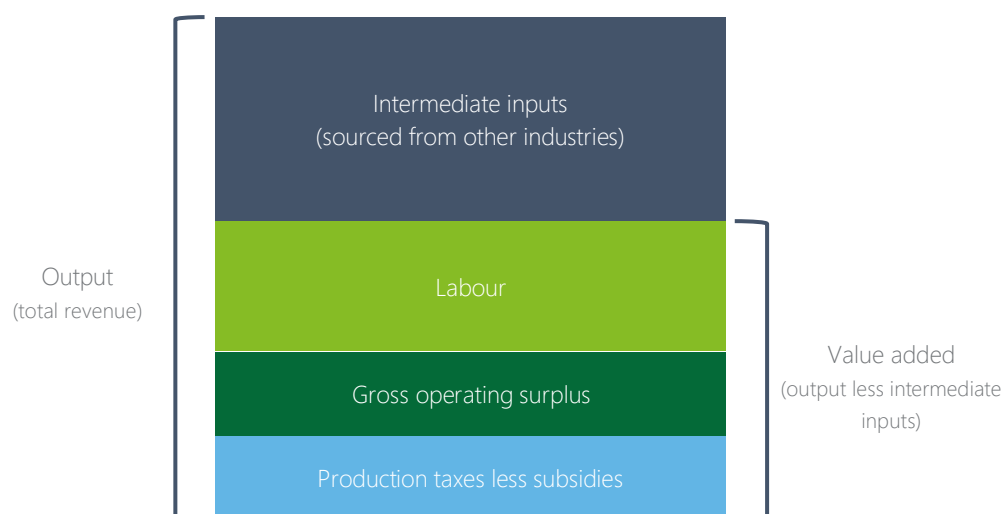
Other measures, such as total revenue or total exports, may be easier to estimate than value added but they 'double count'. That is, they overstate the contribution of a company to economic activity because they include, for example, the value added by external firms supplying inputs or the value added by other industries.

B.2. Measuring economic contribution

There are several commonly used measures of economic activity, each of which describes a different aspect of an industry's economic contribution:

- **Value added** measures the value of output (i.e. goods and services) generated by the entity's factors of production (i.e. labour and capital) as measured in the income to those factors of production. The sum of value added across all entities in the economy equals gross domestic product. Given the relationship to GDP, the value added measure can be thought of as the increased contribution to welfare. Value added is the sum of:
 - Gross operating surplus (GOS) – GOS represents the value of income generated by the entity's direct capital inputs, generally measured as the earnings before interest, tax, depreciation and amortisation (EBITDA)
 - Tax on production less subsidy provided for production – This generally includes company taxes and taxes on employment. Note: Given the returns to capital before tax (EBITDA) are calculated, company tax is not included or this would double count that tax
 - Labour income is a subcomponent of value added. It represents the value of output generated by the entity's direct labour inputs, as measured by the income to labour.
- **Gross output** measures the total value of the goods and services supplied by the entity. This is a broader measure than value added because it is an addition to the value added generated by the entity. It also includes the value of intermediate inputs used by the entity that flow from value added generated by other entities
- **Employment** is a fundamentally different measure of activity from those above. It measures the number of workers employed by the entity, rather than the value of the workers' output.

Figure B.1: Economic activity accounting framework



Source: Deloitte.

Figure B.1 shows the accounting framework used to evaluate economic activity, along with the components that make up gross output. Gross output is the sum of value added and the value of intermediate inputs. Value added can be calculated directly by adding the payments to the primary factors of production, labour (i.e. salaries) and capital (i.e. gross operating surplus (GOS), or profit), as well as production taxes less subsidies. The value of intermediate inputs can also be calculated directly by adding up expenses related to non-primary factor inputs.

B.3. Direct and indirect contributions

The **direct economic contribution** is a representation of the flow from labour and capital involved in the economic activity itself.

The **indirect economic contribution** is a measure of the demand for goods and services produced in other sectors as a result of demand generated by economic activity associated with the Ningaloo Reef. Estimation of the indirect economic contribution is undertaken in an input-output (IO) framework using Australian Bureau of Statistics input-output tables that report the inputs and outputs of specific sectors of the economy.

The **total economic contribution** to the economy is the sum of the direct and indirect economic contributions.

B.4. Limitations of economic contribution studies

While describing the geographic origin of production inputs may be a guide to a firm or activity's linkages with the local economy, it should be recognised that these are the type of normal industry linkages that characterise all economic activities.

Unless there is significant unused capacity in the economy (such as unemployed labour) there is only a weak relationship between a firm's economic contribution as measured by value added (or other static aggregates) and the welfare or living standard of the community. Indeed, the use of labour and capital by demand created from the industry comes at an opportunity cost as it may reduce the amount of resources available to spend on other economic activities.

This is not to say that the economic contribution, including employment, is not important. As stated by the Productivity Commission in the context of Australia's gambling industries:³⁶

³⁶ Productivity Commission (1999), Australia's Gambling Industries, Report No. 10, AusInfo, Canberra (page 419).

Value added, trade and job creation arguments need to be considered in the context of the economy as a whole ... income from trade uses real resources, which could have been employed to generate benefits elsewhere. These arguments do not mean that jobs, trade and activity are unimportant in an economy. To the contrary they are critical to people's well-being. However, any particular industry's contribution to these benefits is much smaller than might at first be thought, because substitute industries could produce similar, though not equal gains.

In a fundamental sense, economic contribution studies are simply historical accounting exercises. No 'what-if', or counterfactual inferences – such as 'what would happen to living standards if this economic activity disappeared?' – should be drawn from them.

The analysis – as discussed in the report – relies on a national input-output table modelling framework and there are some limitations in this modelling framework. The analysis assumes that goods and services provided to the sector are produced by factors of production that are located completely within the state or region defined and that income flows do not leak to other states.

The IO framework and the derivation of the multipliers also assume that the relevant economic activity takes place within an unconstrained environment. That is, an increase in economic activity in one area of the economy does not increase prices and subsequently crowd out economic activity in another area of the economy. As a result, the modelled total and indirect contribution can be regarded as an upper-bound estimate of the contribution made by the supply of intermediate inputs.

Similarly, the IO framework does not account for further flow-on benefits as captured in a more dynamic modelling environment like a CGE model.

B.5. Input-output analysis

Input-output tables are required to account for the intermediate flows between sectors. These tables measure the direct economic activity of every sector in the economy at the national level. Importantly, these tables allow intermediate inputs to be further broken down by source. These detailed intermediate flows can be used to derive the total change in economic activity associated with a given direct change in activity for a given sector.

A widely used measure of the spill-over of activity from one sector to another is captured by the ratio of the total to direct change in economic activity. The resulting estimate is typically referred to as 'the multiplier'. A multiplier greater than one implies some indirect activity, with higher multipliers indicating relatively larger indirect and total activity flowing from a given level of direct activity.

The input-output matrix used for Australia is derived from the 2018-19 Australian Bureau of Statistics Input-Output Tables. The industry classification used for input-output tables is based on ANZSIC, with 114 sectors in the modelling framework.

Appendix C Summary of metrics presented

Metric	Value (\$m)	Measuring	Description	Note	Source	Period	Use	Report reference
1 Total value of all fruit & vegetable production (including processing)	\$339.4	Gross value of production	This figure represents the ABS' estimate of a commodity's average market price multiplied by the total quantity produced in the year.	As this figure uses average prices, it may underestimate the value of Tasmanian produce where this produce commands a premium over mainland produce.	ABS	2018-19	Background information	Chapter 2
2 Total value of fresh produce (all fruits and vegetables excluding processing)	\$309.7	Gross value of production	This figure represents the ABS' estimate of a commodity's average market price multiplied by the total quantity produced in the year.	This is the same figure as (1), however the value of fruits and vegetables that are sent to processing are excluded in this figure.	ABS	2018-19	Background information	Chapter 2
3 Total revenue of four crop types considered (berries, apples, cherries, vegetables)	\$458.1	Revenue	Revenue represents the income earned by a grower to cover their costs and a share for profit.	It is assumed that for most grower's revenue is equivalent to the gross value of production. However, this figure differs from (2) as growers consulted by Deloitte indicated that public ABS data under-represents the true value of Tasmanian production.	Stakeholder consultation combined with public data	2019-20	Input to the economic contribution modelling	Chapter 3

4	Direct value added of the four crop types	\$270.0	Economic contribution	Direct economic contribution represents the value added to the economy arising from the activities of the Tasmanian fresh produce sector. It is different from revenue as it excludes the cost of goods used as inputs. In other words, it represents an industry's revenue exclusive of its non-labour input costs.	This figure is calculated in Deloitte Access Economics' regional input output model, using revenue as an input to the modelling.	Deloitte Access Economics modelling	2019-20	Output of the economic contribution modelling	Chapter 3
5	Indirect value added of the four crop types	\$66.7	Economic contribution	Indirect value added, captures the goods and services produced in up-stream sectors as a result of demand generated by the Tasmanian fresh produce sector. Indirect value added captures the economic activity associated with these inputs.	This figure is calculated in Deloitte Access Economics' regional input output model, using revenue as an input to the modelling.	Deloitte Access Economics modelling	2019-20	Output of the economic contribution modelling	Chapter 3
6	Total value added of the four crop types	\$336.7	Economic contribution	This represents the sum of direct and indirect value added.	This figure is calculated in Deloitte Access Economics' regional input output model, using revenue as an input to the modelling.	Deloitte Access Economics modelling	2019-20	Output of the economic contribution modelling	Chapter 3

Limitation of our work

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