Gascoyne Development Commission

Feasibility Study for Multi-Food Processing Plant

GDC201501197

January 2016

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Executive summary

GHD was engaged to investigate the feasibility of establishing a multi-food processing plant in Carnarvon, to enable increased value adding to the regions local produce.

Feasibility was evaluated from a range of angles, including potential throughput, markets, skills and labour availability, the competitive environment, site suitability and financial performance. Evidence was drawn from desktop analysis, stakeholder consultation, a site visit, operational and financial modelling. Note that this is a preliminary study only, aiming to evaluate the opportunity for potential investors and provide inputs into further evaluation and due diligence.

Below is a summary of the findings from this study.

The regions potential

The Gascoyne Region is well suited for establishing a food processing plant due to its:

- Established and diverse food production industries
- Planned expansion of horticultural production
- Available infrastructure
- Future potential for air and sea exports, particularly to Asian neighbours.

The food processing challenge

Australian fruit and vegetable processing is a difficult operating environment, often characterised by low margins caused by a combination of factors including:

- High production costs (labour and inputs)
- Competition from imported products
- Difficulty catering to changing consumer tastes and preferences

A multi-food processing approach offers a number of benefits over conventional single process or single commodity processing, including:

- Sharing of plant and resources
- Ability to produce products incorporating multiple commodities
- Catering for seasonal produce
- Diversified income
- Ability to divert resources

However there are also some key challenges to the multi-food processing approach including:

- Additional cost and complexity
- Food safety

Processing options

Produce in the region is most suitable for the following broad processing options:

- Value-adding to fresh produce (convenience packs of peeled, sliced, diced products)
- Pulping and juicing
- Drying
- Extended shelf-life processing (including soup, sauce, paste, concentrate or powder).

Each of these options is outlined in more detail below.

Option	Process	Product options	Packaging options
Value adding to fresh product	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Packaging, freezing, storage and dispatch	• Conveniences packs • Fruit or vegetable slices or pieces • Fruit salad	• Modified atmosphere • Vacuum packaging • Trays • Tubs • Bags
Pulping or juicing	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Heat treatment • Fine pulping • Packaging, freezing, storage and dispatch	• Raw pulp • Raw juice	• Vacuum bags • Cartons
Drying	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Sulphating • Dehydration • Packaging, freezing, storage and dispatch	• Dried or semi dried fruit or vegetable pieces	• Bags
Extended shelf-life processing	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Addition of preserves, flavours and other additives • Cooking/evaporation/concentration • Packaging, freezing, storage and dispatch	• Soup • Sauce • Paste • Concentrate • Powder	• Cartons • Pouches • Tubes • Tubs • Bags • Jars

Seasonality of production

Figure (i) below shows the seasonal production of crops for 2012/2013, while Figure (ii) shows the same seasonal production levels aggregated into fruit and vegetables.

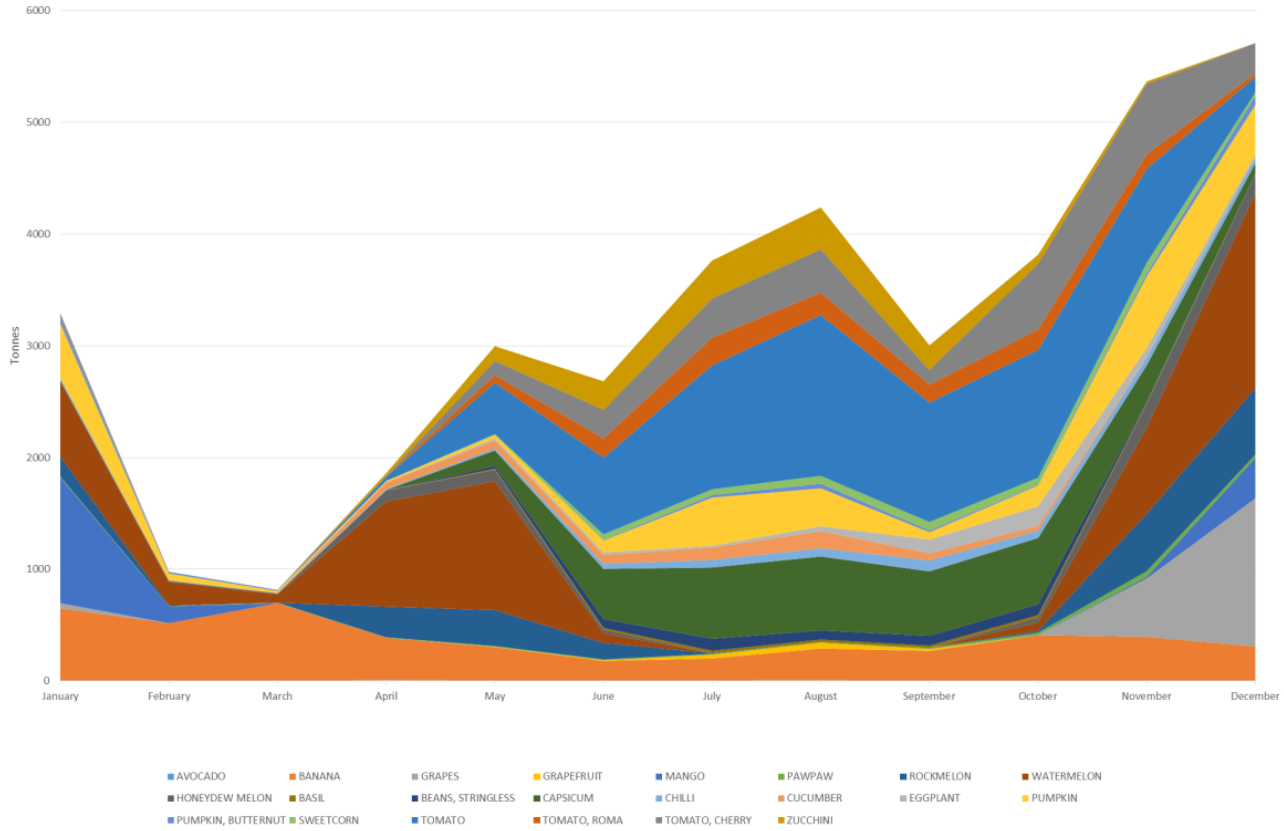

Figure (i) Seasonal volume of production, all crops (2012/13)

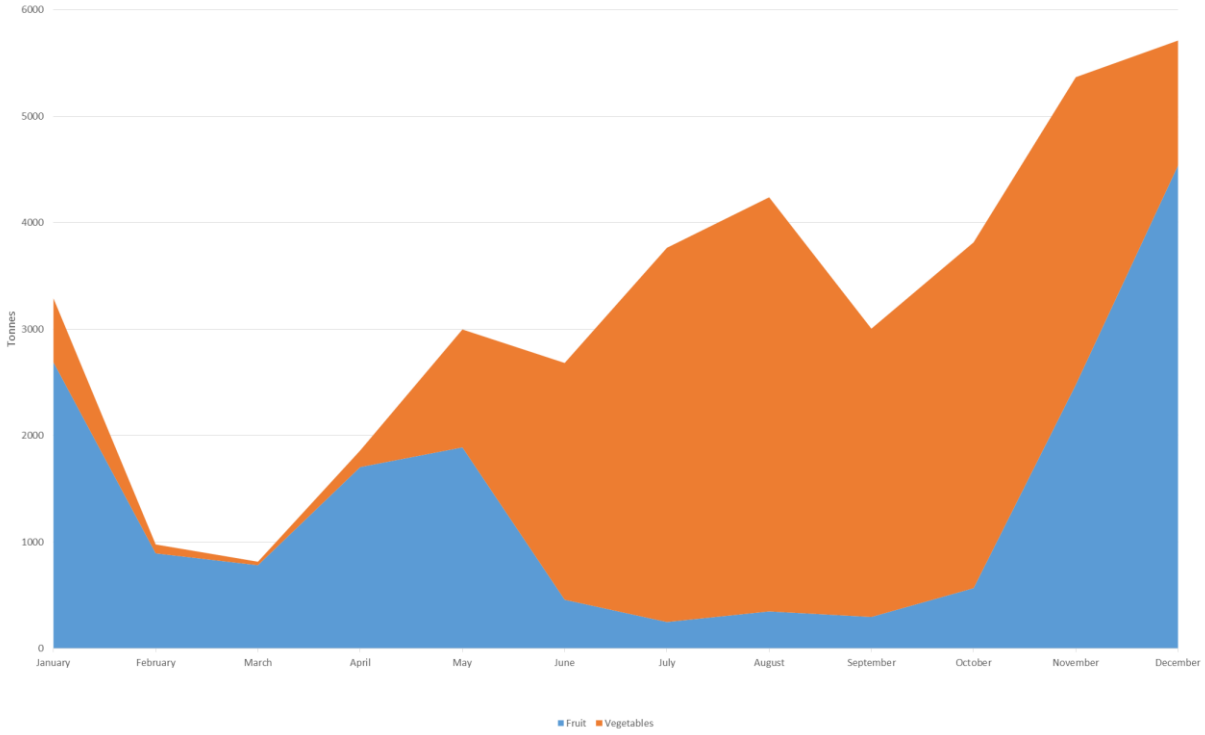

Figure (ii) Seasonal volume of production, fruit vs vegetables (2012/13)

The seasonal variation in throughput could be reduced significantly by altering the level of produce purchased, i.e. purchasing more product when the plant is running below capacity and less product if the plant is running at full capacity.

Similarly the plant could alter its staffing levels and/or operational times to cater for the projected throughput (e.g. close for a period of time during February and March) and add increased shifts during November and December.

Site Suitability

There are a number of sites on the outskirts of Carnarvon which would be suitable for developing a multi-food processing plant. This study identified and evaluated two greenfield sites and one existing facility which could be adapted for this purpose. Below is a summary of the findings.

Site	Pros	Cons
Site A: The Department of Agriculture land on North West Highway (new plant)	• Closest to the growing region • Good road access • Preferred by the reference group	• Currently held by the Dept. of Agriculture • Rezoning required • Potentially flood prone
Site B: Cornish Road industrial land (new plant)	• Available for immediate development • Water and electricity ready	• Non identified
Site C: Babbage Island Factory (upgrade to existing seafood plant)	• Existing factory site, avoids major greenfield development costs.	• Requires negotiation with the current owner. • Farthest site from the production region and transport links to Perth. • Currently being used for seafood processing, therefore food safety issues would need to be managed.

The Cornish Road industrial land was identified as the most suitable greenfield site as it is immediately available, well located and serviced. A number of land parcels are available in this development and further land is likely to become available in the future.

While less suitably located in relation to production and transport links to Perth, the Babbage Island factory offers considerable benefits and cost savings for an investor not wishing for a greenfield development. With excess space and capacity this site would be ideal for establishing an initial pilot plant which could be readily scaled up.

Importantly, the operators of the Babbage Island facility have expressed a strong interest in investigating options for developing the site.

Plant design

The scope of this study did not extend to plant design, however for scoping purposes a broad potential plant process design was established with a number of possible variations including:

- Base option: Value adding to fresh product, pulping and juicing
- Base option + drying process line
- Base option + drying process line + extended shelf-life processing line(s)

Financial viability

The financial analysis evaluates each of the options in terms of annual profit as well as the discounted Net Present Value (NPV) of returns over a 20 year investment timeframe, discounted at 7%.

The analysis found processing margins to be very tight and in some cases negative. Broadly the analysis found the base option (a facility producing pulp and value adding fresh product) would be the most viable option. Additional processing lines for drying and extended shelf-life processing were projected to return operating losses.

Not surprisingly upgrading the existing Babbage Island facility was found to be more viable than establishing a greenfield site, largely due to the avoided establishment costs.

Item	Greenfield Site			Babbage Island Site		
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Initial CapEx	$5,148,000	$5,478,000	$8,228,000	$2,959,000	$3,289,000	$6,039,000
OpEx	$3,370,952	$4,099,559	$5,180,825	$3,119,710	$3,959,057	$5,030,323
Produce Purchase Costs	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676
TOTAL ANNUAL COSTS	$10,548,628	$11,277,236	$12,358,501	$10,297,386	$11,136,734	$12,207,999
Sales revenue	$10,926,476	$11,086,554	$11,140,209	$10,926,476	$11,086,554	$11,140,209
Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171

Care should be taken when interpreting the financial analysis as the results are highly dependent on a range of cost, revenue and operational assumptions[1].

[1] Cost estimates have an indicative possible variance of +40%, - 10% accounting for changes in scope, design, currency movements etc.

Breakeven analysis

Presented below are the prices and costs required to return a breakeven NPV over a 20 year timeframe.

Variable	Greenfield Site			Babbage Island Site		
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Price received (factory door price as % of final retail price)	61%	65%	73%	59%	63%	71%
Cost of produce inputs ($/kg)	$0.98	$0.88	$0.70	$1.03	$0.93	$0.75
OpEx (percent change from modelled scenario)	-4%	-20%	-40%	7%	-12%	-35%
CapEx (percent change from modelled scenario)	-20%	-135%	-228%	64%	-131%	-258%

Investment and ownership models

The facility could be developed using a range of investment or ownership models including direct ownership (by an existing food processor, foreign investor or other domestic investors).

The facility may also be suitable for other more alternative models including:

- Joint venture of share ownership between multiple processors
- Processing service provision

Establishing an offtake agreement with a domestic of foreign buyer may help to secure finance for the plant's establishment.

A cooperative structure was not preferred by stakeholders however may still have some potential.

Recommendations

Consider establishing a pilot plant on the Babbage Island facility

This study has found the development of the Babbage Island facility represents the most viable option for establishing a food processing presence in the region. The existing facility offers an excellent opportunity to establish a pilot fruit and vegetable processing plant which would assist the operator refine their processes, products, target markets and branding.

If successful the operation could easily be scaled up within the existing Baggage Island site, or through the establishment of a new greenfield plant in the region. With an established process, product, market and brand, attracting capital investment for such an expansion is likely to be considerably easier.

Pursue niche domestic market opportunities

This study has highlighted the need for a facility to produce products which are differentiated from imported products on the grounds of food safety, convenience and quality. This may involve pursuing:

- Higher end domestic markets e.g. food service
- Potential export markets where food safety will attract substantial premiums (e.g. baby food to China)

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1. Introduction

1.1 Background

The development of a multi-food processing facility in the Gascoyne region of Western Australia was identified as a high priority in the draft Gascoyne Regional Investment Blueprint (WA Department of Regional Development 2015), with the potential to create transformational long-term change for the region.

Horticultural producers in the region are highly dependent on external markets and therefore highly dependent on good transport infrastructure for reliable movement of materials and produce to market.

GHD has been engaged to undertake this study on behalf of the Gascoyne Regional Development Commission.

1.2 Purpose of this Report

The purpose of this report is to investigate the feasibility of developing a multi-food processing plant in Carnarvon. The report includes:

- Analysis of different options including commodities and processing methods
- An economic analysis and recommendations on the type of processing plant to be built and the products that can be made to demonstrate a financial argument for developing the plant and to also enable the attraction of private investors. This includes ownership options for the facility;
- Investigation and recommendation to ascertain the most suitable location for the plant to be built;
- The necessary standards associated with public health and the need to carefully assess whether various produce and meats etc can be 'mixed' within a single plant; and
- Investigation as to whether the plant would be able to operate all year round, including required staff levels.

1.3 Scope

1.3.1 Study Area

This study considers the feasibility of a multi-food processing plant located in or around Carnarvon, with produce being drawn primarily from the broader Gascoyne region (Figure 1), which takes in the shires of Carnarvon, Exmouth, Shark Bay and Upper Gascoyne. Adjacent regions were considered in the study for their potential to supply additional produce and/or transport infrastructure.

Figure 1 Study Area[2]

1.3.2 Scope and Limitations

The feasibility study includes the following elements:

- Review of the Gascoyne region including climate, geography, population, industry, services, markets and infrastructure (Section 2)
- Review of local food production industries (Section 3)

[2] Gascoyne Regional Development Plan 2010 - 2020

- An overview of fruit and vegetable processing in Australia (Section 4)
- An introduction to multi-food processing (Section 0)
- An analysis of potential processing options (Section 6)
- An analysis of plant design options (Section 7)
- Evaluation of suitable areas within Carnarvon for developing the plant (Section 8)
- Cost estimation and financial analysis (Section 9)
- Risk analysis (Section 10)
- Potential investment and ownership options (Section 11)
- Findings and recommendations (Section 12)

This study aims to provide an initial assessment of feasibility, to inform further analysis and due diligence from potential investors.

1.4 Methodology

This project was completed in the following steps:

1. Project inception meeting
2. Formation of a project reference committee of local industry and government stakeholders including:
   - Joyce Babun Loveapple
   - Simon Moore Carnarvon Chamber of Commerce and Industry
   - Tom Day Plantation Owner
   - Doriana Mangili Sweeter Banana
   - Paul Shain Gascoyne Food Council
   - Paul Hannah Gascoyne Development Commission
   - Valerie Shrub DAFWA
3. Desktop review
4. Site visit, reference committee workshop and consultation (List of stakeholder consulted is provided in Appendix B)
5. Further analysis of plant feasibility
6. Reporting and presentation of results

2. About the Gascoyne Region

2.1.1 Climate, geography and natural assets

Soils

The Gascoyne region has red semi-arid soils, tending towards lighter sandy calcareous soils nearer the coast. Organic matter is low and generally concentrated within the top few millimetres. The alluvial soils of the Carnarvon plantation area are loamy fine sands or silty loams. They are well drained and alkaline. Fertility is high and only small amounts of nitrogen fertiliser are required for high yields (GDC 2014).

Geology

Much of the region is covered by a large sedimentary basin known as the Carnarvon Basin. The basin slopes gently towards the coast and is characterised by low relief, open drainage and large gently undulating sand plains. Rocks in the region are highly weathered or overlain by soil or eolian sand. Extensive evaporite deposits of gypsum and salt occur in natural depressions near the coast (GDC 2014).

Climate

The region has a moderate arid tropical climate (Figure 2) receiving around three hundred and twenty days of sunshine each year.

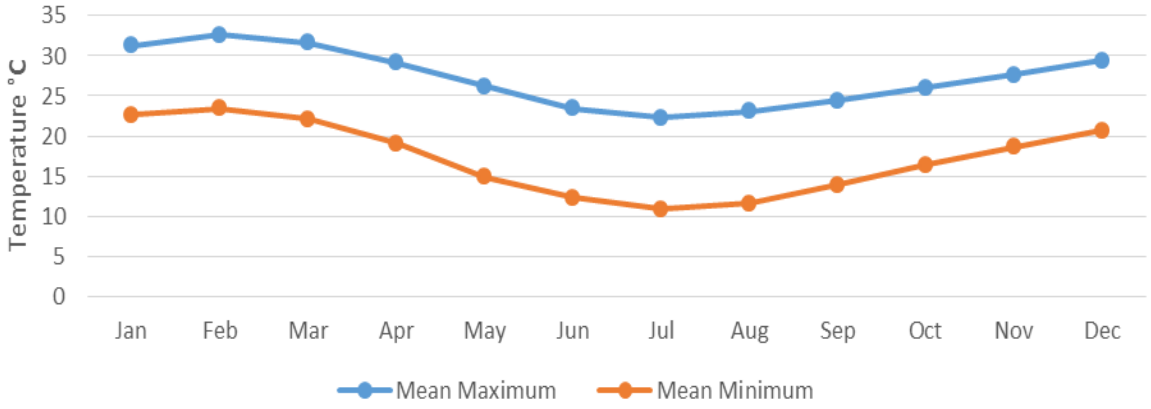


Figure 2 Average maximum temperature at Carnarvon Meteorological Office

The region has a relatively low rainfall averaging 227 millimetres per year (Figure 3). Rainfall is often linked with cyclonic activity and is therefore highly variable.

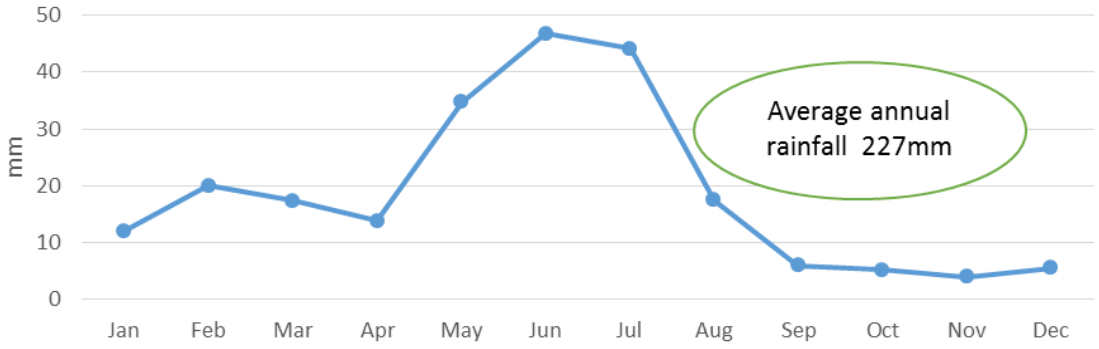


Figure 3 Average rainfall recorded at Carnarvon Meteorological Office

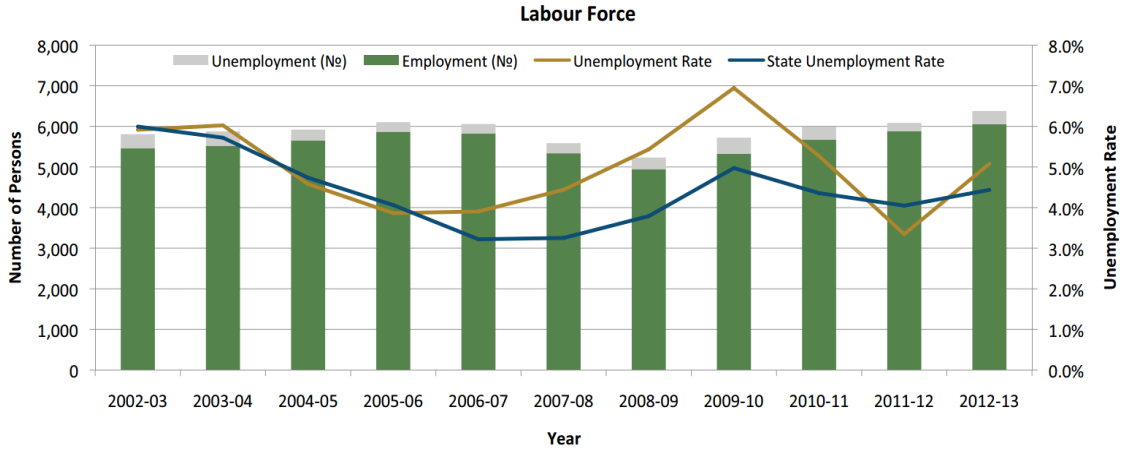
The summer months are suited to the growth of tropical and sub-tropical fruits under irrigation, while temperatures in autumn, winter and spring are ideal for vegetable crops.

The area is highly susceptible to cyclones with the local banana industry experiencing cyclone damage on average every four years. The most severe cyclone occurred in 1960, with maximum wind speeds of 200 kilometres per hour.

2.1.2 Population

In 2013[3] The Gascoyne Region supported a population of 9,899 which accounts for 0.4 per cent of Western Australia's total population. The Shire of Carnarvon has over 6,100 residents or 62 per cent of the regional population. The region's population is expected to experience steady growth reaching 10,200 residents by 2016 (GDC 2014).

Figure 4 below highlights the trends in labour force participation between 2002-03 and 2012-13. The Gascoyne's strong labour market has recently been credited to an increase in mining and construction opportunities.



Source: Department of Employment with additional estimates by the Department of Regional Development.
Note: Labour Force is an average of the financial year's quarterly data.

Figure 4 Gascoyne labour force participation

2.1.3 Industry

The Gascoyne region has a diverse economy with tourism, fishing, mining, horticulture and pastoralism being the main industries. The most recent Census figures (Table 1) show a marked increase in the proportion of residents employed in the mining and construction industries, and a corresponding decrease in other industries including agriculture, forestry and fishing. The considerable slowing of mining investment in recent years is likely to have changed this trend.

[3] *Gascoyne: a region in profile 2014.* Government of Western Australia Department of Regional Development.

Table 1 Employment by industry 2006 - 2011

Industry of Employment	2006	2011
Agriculture, Forestry and Fishing	13.6%	10.7%
Accommodation and Food Services	9.8%	9.9%
Public Administration and Safety	10.1%	9.9%
Retail Trade	10.5%	9.8%
Construction	6.5%	9.0%
Education and Training	7.7%	7.4%
Health Care and Social Assistance	8.2%	6.9%
Transport, Postal and Warehousing	4.6%	6.8%
Mining	4.1%	6.1%
Real Estate, Administrative and Support Services	4.9%	5.2%
Manufacturing	6.7%	4.6%
Other Services	2.5%	3.0%
Professional, Scientific and Technical Services	1.8%	2.8%
Wholesale Trade	2.4%	2.1%
Electricity, Gas, Water and Waste Services	1.4%	1.5%
Inadequately described / not stated	3.3%	2.4%
Arts and Recreation Services	0.8%	0.8%
Information Media and Telecommunications	0.5%	0.5%
Financial and Insurance Services	0.7%	1%

Source: ABS 2011 and 2006 Census of Population and Housing; usual residence.

2.1.4 Land Transport

The major road servicing Carnarvon is the North West Coastal Highway, which is a major freight route for coastal Western Australia. Local industry often enjoys cheaper freight costs to Perth due to trucks seeking to backload. Carnarvon has no railway access.

2.1.5 Air transport

Carnarvon Airport is a Council owned facility, which operates daily passenger services from the Gascoyne Region via Geraldton and Monkey Mia en route south to Perth. The airport also services other regional destinations for lighter aircraft including chartered flights.

In May 2014 the Council adopted the Airport Structure Plan (Hames Sharley 2014) which will see the current airport site further developed to cater for jet aircraft.

There are numerous airports within 500km of Carnarvon, including Learmonth which is 320Km to the North, and capable of accommodating large jet aircraft used for international flights (Figure 5).

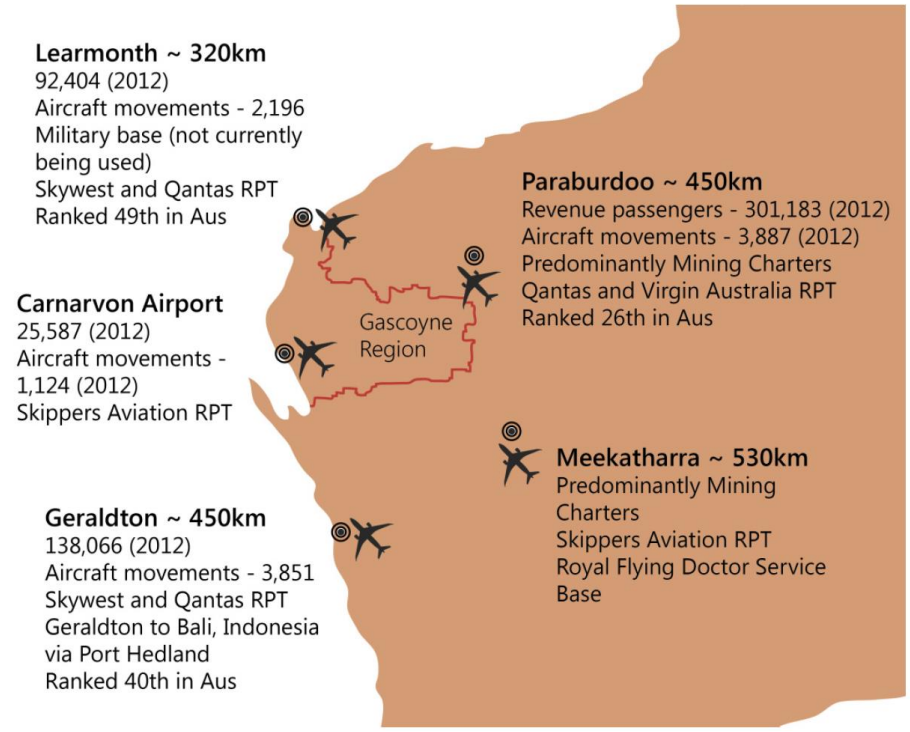


Figure 5 Airports in and around Carnarvon

Source: Hames Sharley 2014

2.1.6 Sea Transport

Carnarvon is home to two ports:

- Carnarvon Small Boat Harbour: Servicing fishing and recreational vessels
- Cape Cuvier (privately owned by Rio Tinto): Servicing the Lake MacLeod solar salt operation. This harbour is in the process of being upgraded to cater for Panamax size ships of up to 80,000 tonnes.

The development of a third port is being considered for South Bejaling, 18km north of Carnarvon. This port would provide deep sea berth space to support increased import and export demand, particularly from the local salt, gypsum, live cattle and horticultural industries (AECOM 2010). The proposed port would cater for container vessels as well as bulk, live animal and oil/gas vessels. The nearest container port is currently Geraldton, 480km south.

2.1.7 Water

The Gascoyne River and its tributaries extend 500 kilometres inland has a catchment area of 6.7 million hectares. The Gascoyne River flows occasionally between February and August. The river flows re-charge groundwater aquifers in the river bed which provide irrigation water for the region's horticultural producers and other users.

Town water usually accounts for approximately 1.8 GL whereas the irrigation industry uses 6-7 GL per year. Owners of horticultural properties along the north and south banks of the Gascoyne River between the east end of McGlades Road and west of Chinamans Pool generally extract about 5-6 GL of water from private bores.

2.1.8 Energy

The existing Carnarvon Power Station is owned, managed and operated by Horizon Power. The power station is located at Iles Rd, adjacent to the Horizon Power depot, and comprises of a mix of mobile diesel generators, gas generators and dual fuel generators. Diesel fuel is trucked in from Geraldton some 500km to the south and gas is delivered via a spur line off the Dampier -

Bunbury gas line which runs a short distance to the east of Gascoyne Junction. The spur line roughly follows the Carnarvon – Mullewa Rd for most of that distance.

The town of Carnarvon is currently supplied from six 22 kV distribution feeders emanating from the existing Power Station. The HV distribution network in Carnarvon is predominantly overhead conductor with some underground cable in the newer areas.

Due to an increase in PV installation, Carnarvon currently has high non-dispatchable photo-voltaic (NDPV) penetration. Based on Horizon Power's monthly renewable energy monitoring report, in July 2013 the total installed and proposed NDPV was 1112.5 kW.

Energy Made Clean (EMC) officially opened its Carnarvon Solar Power Station in May 2012. The 290kW plant is located in Carnarvon. It is the biggest solar installation in the region and also the largest solar plant owned by a private company. EMC invested $2.9m on the plant's construction. Electricity generated by the solar plant will be sold to Carnarvon utility Horizon Power under a power purchase agreement.

2.1.9 Recent infrastructure improvements

The following infrastructure projects have been recently completed or committed to under The Gascoyne Regional Planning and Infrastructure Framework.

- Exmouth Boat Harbour Stage 1 – new boat pens;
- new Mungullah Power Station, Carnarvon;
- new Coral Bay workers' accommodation village;
- Carnarvon Flood Mitigation Strategy Stage 2 works;
- Regional Mobile Communications Project;
- new regional police and justice complex – Carnarvon;
- Carnarvon Community College (Stage 1) – construction of a new K-12 campus;
- Ningaloo Centre – regional scientific research, community and visitor centre;
- Carnarvon Hospital redevelopment; and
- new community and primary health centre at Exmouth Health Campus.

In addition to the above completed or committee to infrastructure improvements, the framework identifies a range of potential future infrastructure projects, listed in Table 2 below.

Table 2 Potential future infrastructure projects

Area	Potential projects
Transport	• North West Coastal Highway upgrades • Minilya–Exmouth Road upgrades, including: • Robinson Street (Carnarvon) upgrades, including: • Construct western portion of Banksia Drive and carpark (Coral Bay) • Coral Bay Road upgrades – widen road and upgrade intersections • Sealing of Useless Loop Road • Yardie Creek Road upgrade • Ullawarra Road upgrade – seal from Gascoyne Junction to the eastern entrance of the Kennedy Range National Park • Upgrading regional airport facilities at Carnarvon • Learmonth Airport capacity review, including consideration of the airport's capacity to accommodate international aircraft emergency landings, growth in regular passenger transit traffic and potential expansion of the oil and gas industry • Inland Gascoyne Road Infrastructure Planning, • Gascoyne Future Maritime and Boating Facilities Study, including planning for further development of Carnarvon Boat Harbour, expansion planning for Exmouth Boat Harbour including requirements for cruise ship infrastructure and planning for other boating facilities within the region • Proposed Bejaling deepwater port – data gathering and engineering studies
Water and wastewater	• Exmouth flood mitigation works • Relocation of the Exmouth wastewater treatment plant • Carnarvon Artesian Basin Rehabilitation Project (Stage 3) – redrilling and capping of artesian bores • Exmouth borefield – new bores in southern legs 7 and 8
Energy	• Gascoyne Underground Power Project including Carnarvon, Exmouth and Denham • Upgrades to Exmouth borefield high voltage power lines
Science and communication	• National Broadband Network – optical fibre rollout and next generation wireless coverage to Gascoyne towns
Social Infrastructure	• New aged care facilities for the Gascoyne, including Carnarvon, Exmouth and Denham • Carnarvon multi-purpose medical centre – construct new centre to assist in accommodating permanent and visiting practitioners
Tourism	• New and upgraded facilities in Department of Parks and Wildlife managed lands in the Gascoyne • Baiyungu Track – establish an adventure walking trail between Carnarvon and Exmouth

3. Local food production industries

Horticultural produce would be the major input into any future food processing plant, however additional opportunities have been identified for value adding to seafood and red meat products. Each of these commodity groups are analysed in more detail below.

3.1 Horticulture

Horticulture, based along the Gascoyne River, is a strong contributor to the economy of the Region. In 2013 the Department of Agriculture and Food WA (DAFWA) valued Carnarvon's horticulture output at $75 million, down from $104 million in 2012 due to reduced water allocations, poor market prices and additional competition from domestic and international markets.

A key advantage of the Gascoyne horticultural industry is its ability to produce out-of-season commodities for domestic markets, as well as potentially exporting to nearby Asian and the Middle-Eastern countries.

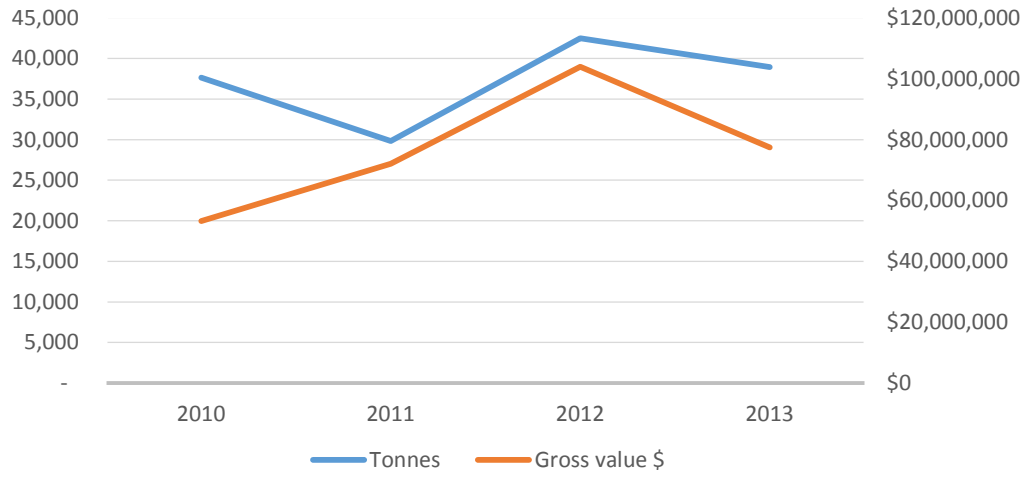


Figure 6 Total annual horticultural production

Fruit and vegetable production statistics can be seen in Table 3 and Figure 7 below.

Table 3 Fruit and vegetable production 2012 and 2013

Crop	2012		2013			
	Tonnes	Value	Tonnes	Value	% change (t)	% change ($)
Avocado	33	139,022	29	77,512	-12.8	-44.2
Bananas	6,748	9,861,581	4,577	8,321,493	-32.2	-15.6
Grapes	1,329	11,375,164	1,891	8,734,162	42.2	-23.2
Grapefruit	203	251,717	116	164,100	-43.0	-34.8
Mango	1,063	3,511,848	1,783	4,388,081	67.8	25.0
Pawpaw	96	265,762	140	267,147	45.7	0.5
All melons	9,383	7,873,133	8,468	7,085,875	-9.8	-10.0
Other fruit	105	551,413	79	430,772	-24.7	-21.9
Basil	181	186,533	130	189,554	-28.3	1.6
Beans	451	2,887,381	488	2,360,945	8.3	-18.2
Butternut	257	247,570	265	136,474	3.1	-44.9
Capsicum	2,423	8,050,349	3,489	8,962,811	44.0	11.3
Chilli	526	2,944,190	521	1,821,831	-0.9	-38.1
Cucumber	449	1,512,407	590	1,844,816	31.3	22.0
Eggfruit	693	1,863,931	507	911,048	-26.9	-51.1
Pumpkin	4,764	4,210,208	2,824	1,776,720	-40.7	-57.8
Sweetcorn	378	614,842	443	567,556	17.2	-7.7
Cherry tomato	2,426	17,038,470	2,788	12,643,600	14.9	-25.8
Roma tomato	1548	4,341,223	1,202	2,355,549	-22.3	-45.7
Tomato	7,812	20,465,813	6,931	10,368,461	-11.3	-49.3
Zucchini	1,317	2,641,223	1,451	2,846,843	10.2	7.8
Other vegetables	321	3,134,420	241	1,169,659	-24.8	-62.7
Grand total	**42,507**	**103,968,198**	**38,952**	**77,425,010**	**-8.4**	**-25.5**

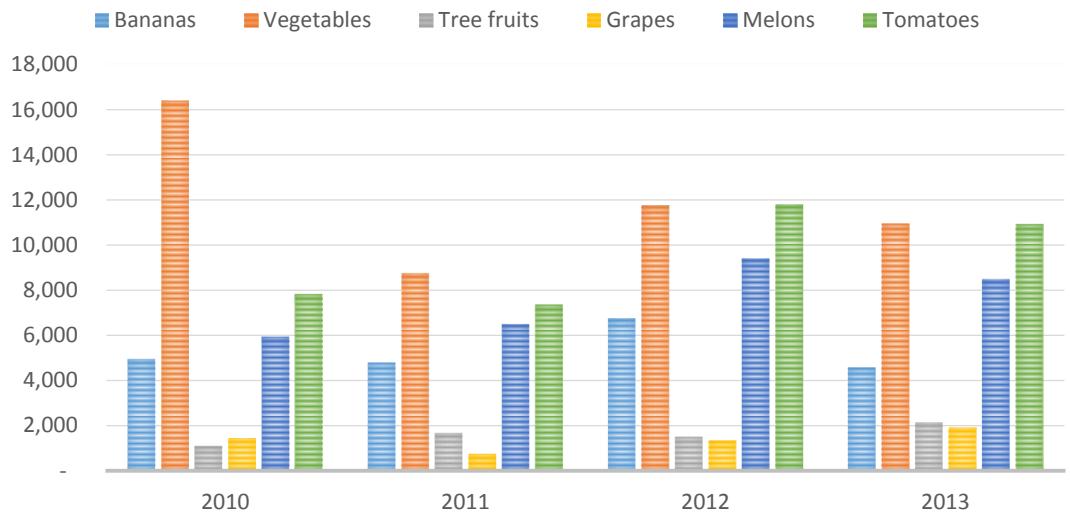


Figure 7 Annual horticultural production volume (tonnes)

3.1.1 Seasonality of production

Seasonality of production is crucial in determining the viability of any kind of food processing facility. Ideally, processing facilities require year round throughput in order to maintain the plant as well as employment. Figure 8 and Figure 9 show the seasonality of fruit and vegetables in the region.

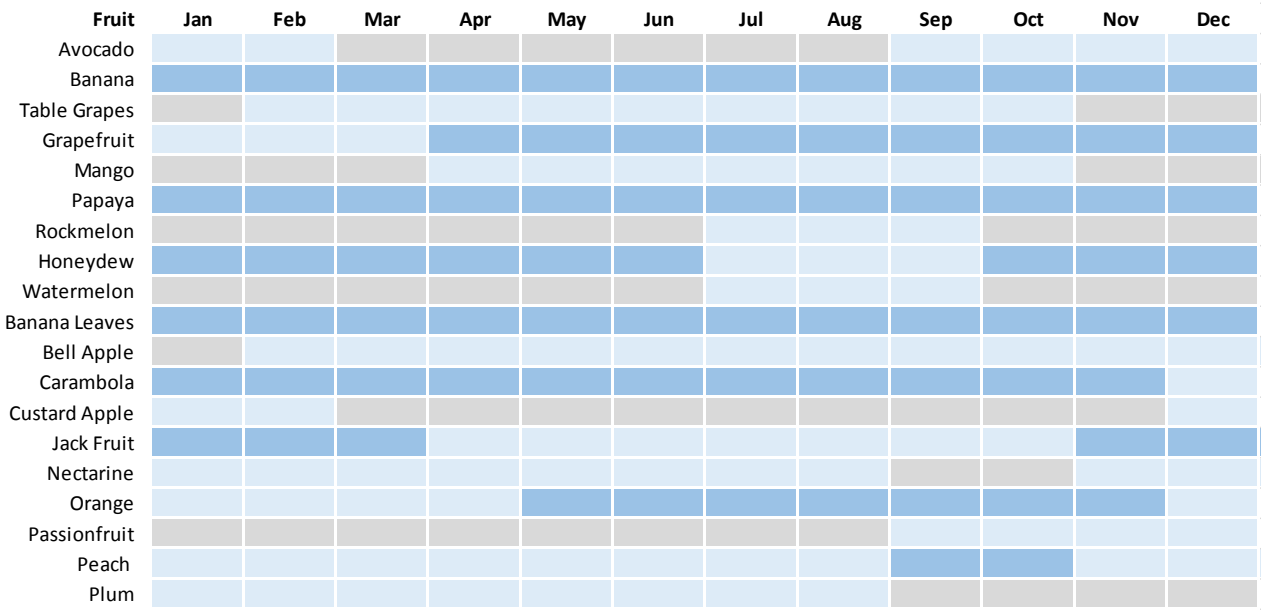


Figure 8 Seasonality of fruit production - by product[4]

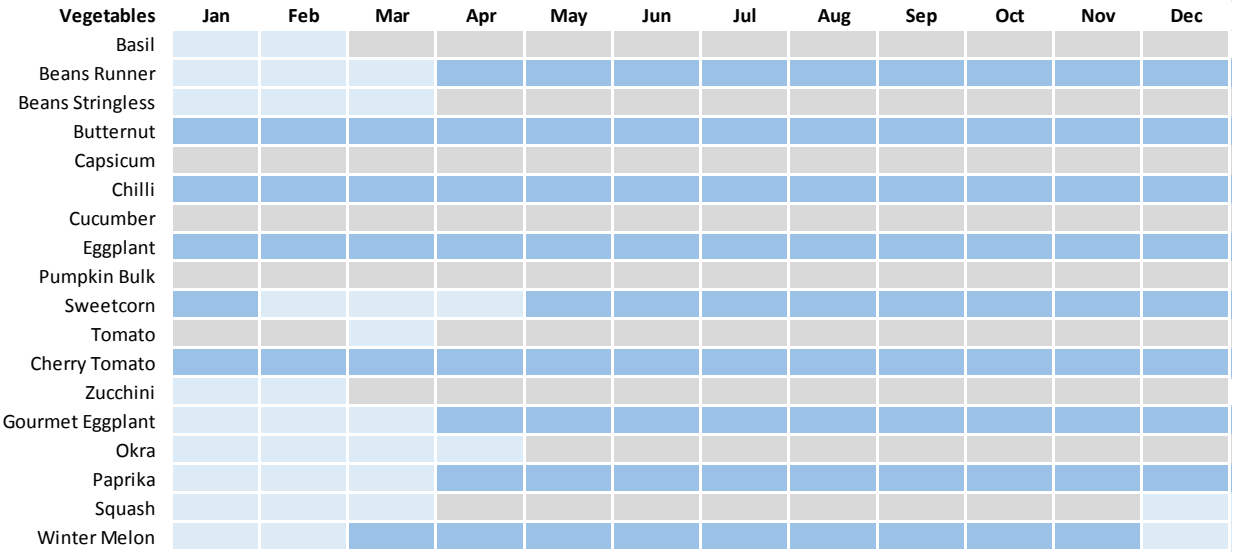


Figure 9 Seasonality of vegetable production - by product

Figure 10 below shows the seasonal production of crops for 2012/2013. Figure 11 shows the same seasonal production levels aggregated into fruit and vegetables.

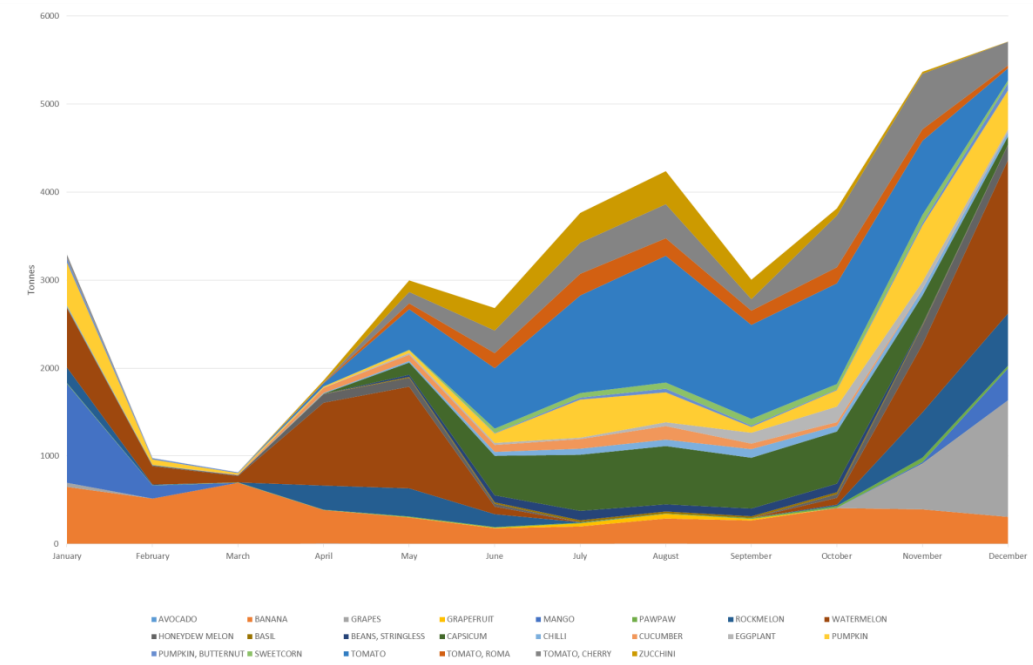


Figure 10 Seasonal volume of production, all crops (2012/13)

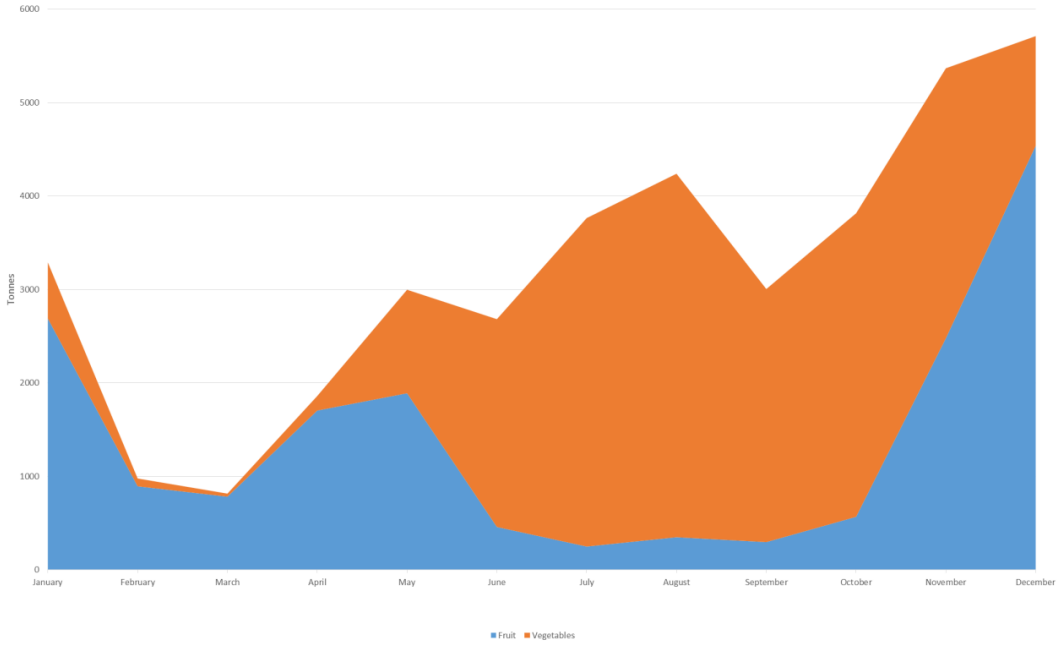


Figure 11 Seasonal volume of production, fruit vs vegetables (2012/13)

3.1.3 Waste

Waste occurs at all levels of the fruit and vegetable supply chain due to produce becoming damaged, downgraded, rejected or otherwise unmarketable. Verghese, Lewis, Lockrey, Williams (2012) estimate that 66% of fruit and vegetable produce is wasted between production and consumption, with 20% waste levels occurring at production, 4% during post-harvest handling and storage, and 2% during processing and packaging (Figure 12).

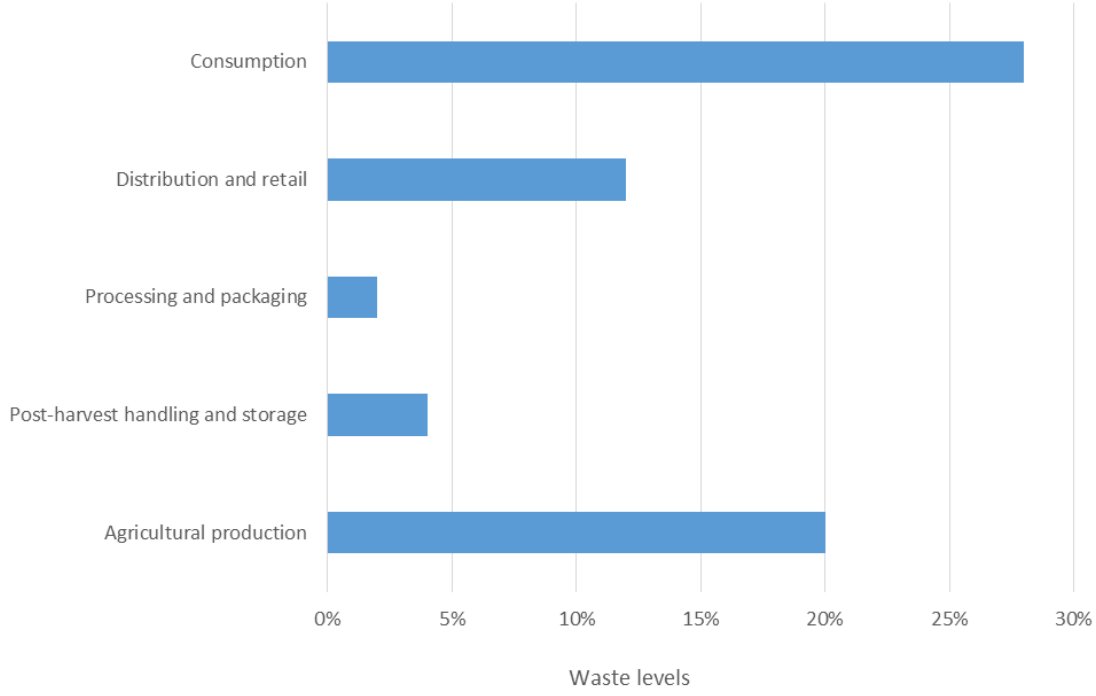


Figure 12 Estimate waste levels in the fruit and vegetable supply chain (Verghese, Lewis, Lockrey, Williams 2012)

In the Gascoyne region the level of horticultural waste is often cited as being higher than average (around 30%), due to the areas susceptibility to cyclones and floods and the uncontrolled (open air) production systems. Producers in the region are also heavily reliant on the Perth wholesale market which is a relatively long distance away (900km). Often producers in the region have produce which is downgraded but still marketable, and are therefore forced to either transport to Perth and hope to redeem costs, or cut their losses and dispose of the product.

Waste produce is either disposed on farm or taken to landfill. A 2009 study recommended that in the longer term a composting facility could be established on the nearby Brown Range landfill site, to process green waste and horticultural waste from growers (Bowman & Associates 2009).

3.1.5 Industry vision

The Gascoyne Regional Investment Blueprint 2015, established a vision for the local horticultural industry summarised in Table 4 below, which includes a 300% increase in production area, a 350% increase in production value, and the development of infrastructure to enable direct export via air and sea.

Table 4 2050 Vision for the Horticultural Industry (GDC 2015)

	2015	2050 Vision
Area under cultivation	1,200	3,600
Value of annual production	$80M	$283M
Employment – total workforce	375	1,100
Direct international export	No	Yes

3.1.6 The Gascoyne Foodbowl Initiative

The Western Australian Government (through the Royalties for Regions program) has allocated $25 million for the Gascoyne Foodbowl Initiative, which aims to increasing horticulture production in Carnarvon by an additional 400 hectares, matched with water resource development. Table 5 below outlines progress to date against the three core outcomes of the initiative.

Table 5 Gascoyne Foodbowl Initiative: Progress against outcomes

Outcome	Progress to date
1. Sourcing and delivery of an additional 4 gigalitres of water for horticulture	• Drilling to date has focused on a 12km section north of the Gascoyne River upstream of Carnarvon. • At the end of 2014, one-third of the drilling exploration was complete and early results indicated that the amount and quality of the water were suitable for agricultural production. Of the 54 exploration bores completed to date, about half meet the criteria for consideration as future pumping wells, with sufficient thickness of sand, potential yield and quality. • The final list of production bores to be drilled will consider the availability of key infrastructure, like power and pipelines, access to sustainable recharge and demand for water.
2. Borefield electrification	• In December 2014 the existing borefield was connected to electricity, replacing the existing diesel powered generators, which were more expensive to run and less reliable.
3. Land development	• Technical studies have identified around 600Ha of high to moderate capability land, suitable for annual and perennial horticulture. • The Department of Lands is currently seeking approval from the Minister for Lands to proceed with tenure change and Native Title negotiations.

3.2 Other potential produce inputs

3.2.1 Seafood

The Gascoyne region is home to three of the state's more valuable fisheries (the Shark Bay Prawn, Exmouth Gulf Prawn and Shark Bay Scallop fisheries). The region also hosts a small pearling industry and aquaculture ventures in prawns, tropical rock lobster, squid and live coral are in development stages. In 2011/122 aquaculture in the region was valued at around $10 million.

Figure 13 and Figure 14 below show the volume and value of seafood production over the past 15 years.

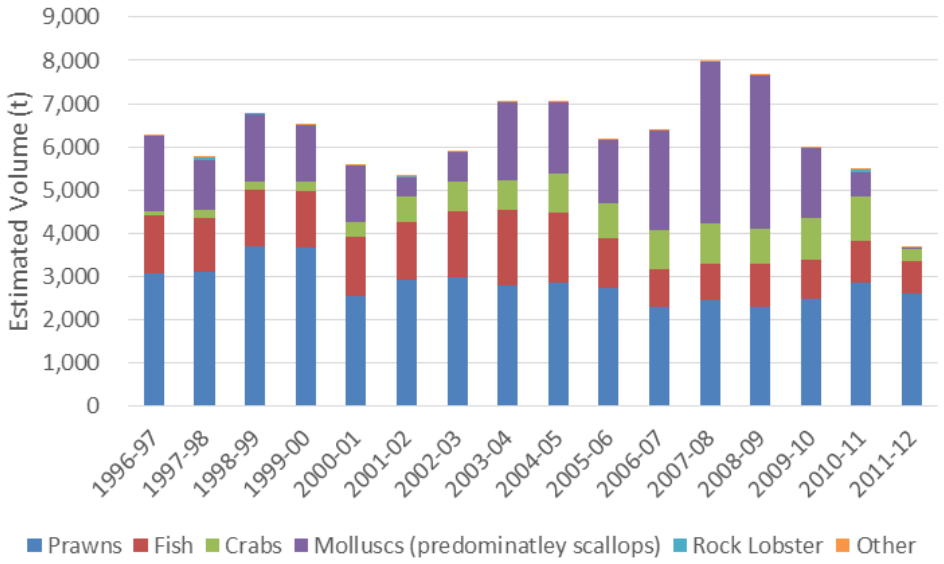


Figure 13 Historical Gascoyne catch volume

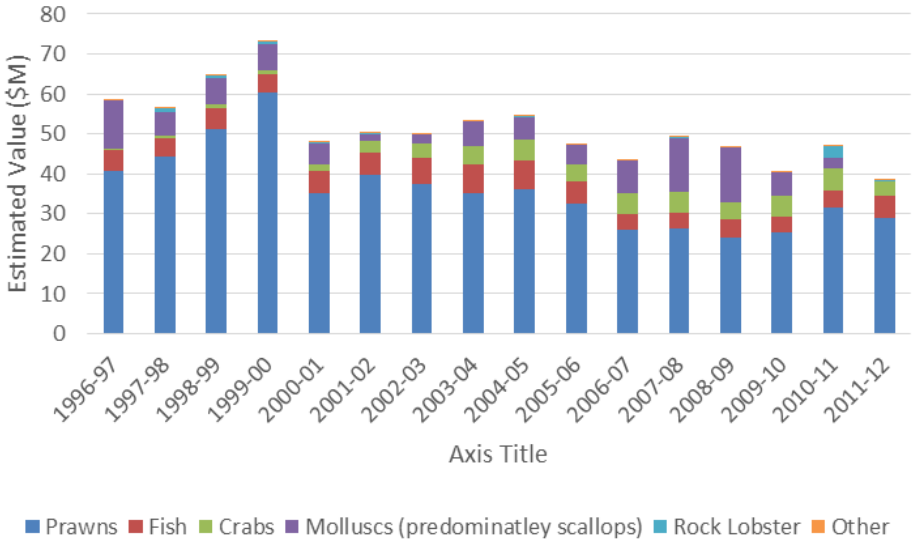


Figure 14 Historical Gascoyne catch value

Table 6 below provides a summary of the different seafood commodities in terms of the typical supply chains and prices received by fishers. The large majority of seafood is transported unprocessed by road to Perth before being exported or sold onto the local market. Crab processing is the only on-land seafood processing activities currently occurring in Carnarvon.

Table 6 Supply chains and indicative prices

Commodity	Supply chain	Indicative price received ($/kg)
Prawns	• Sorted, graded, (sometimes cooked) and packed at sea • Transported to Perth via road	$11
Fish	• Sorted and placed in brine at sea • Single consignments transported to Perth via road every 2-3 days	$7
Crabs	• Caught by smaller crab fishing enterprises and also as a by-product from larger trawlers • Processed in Carnarvon and sent to Perth	$13
Scallops	• Fisheries are re-opening in 2015 after being closed due to low stock • Generally shucked at sea and transported to Perth via road	$8
Rock Lobster	• Transported to Perth via road	$45

Industry Vision

The Gascoyne Regional Investment Blueprint (Western Australia Department of Regional Development 2015), established a vision for the local fishing and aquaculture industry summarised in Table 7 below. The vision includes a modest 25% increase in fishing production, and a 300% increase in aquaculture production.

Table 7 2050 Vision for the Gascoyne Fishing and Aquaculture Industry (GDC 2015)

	2015	2050 Vision
Value of annual production (fishing)	$40M	$50M
Value of annual production (aquaculture)	$10M	$30M
Employment	80	130

3.2.2 Red meat

The Gascoyne pastoral sector was devastated by the 2010/11 floods and a massive bush fire in December 2011 to the end of January 2012 which burnt over 900,000 hectares. The ban on live exports also had a severe financial impact in 2012/13. DAFWA statistics state the disposal of sheep and cattle for meat was $23.5 million for the financial year ending 30 June 2011. This has increased to $25 million to the financial year ending 30 June 2012. Figure 15 shows the historical values of livestock disposals for the decade between 1998 and 2008.

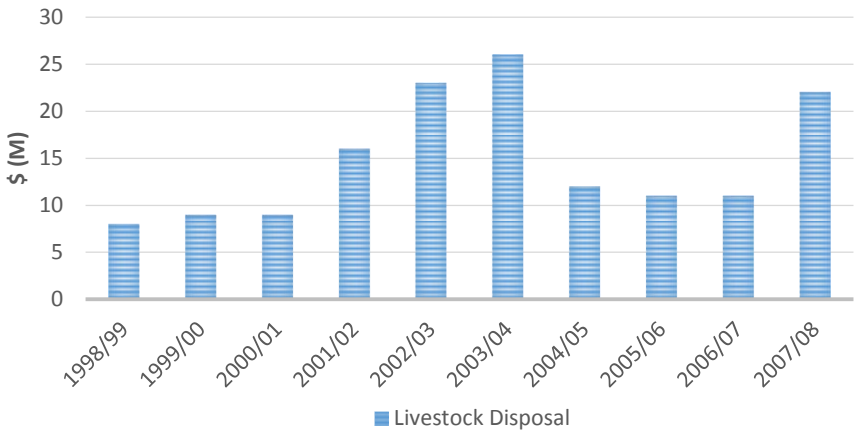


Figure 15 Historical livestock value

Livestock from the region are either exported live via Geraldton (480km south of Carnarvon), or processed in either Geraldton (sheep and goats) or the Perth region (cattle, sheep and goats). Figure 16 below summarises the annual movement of cattle within the Gascoyne and broader regions.

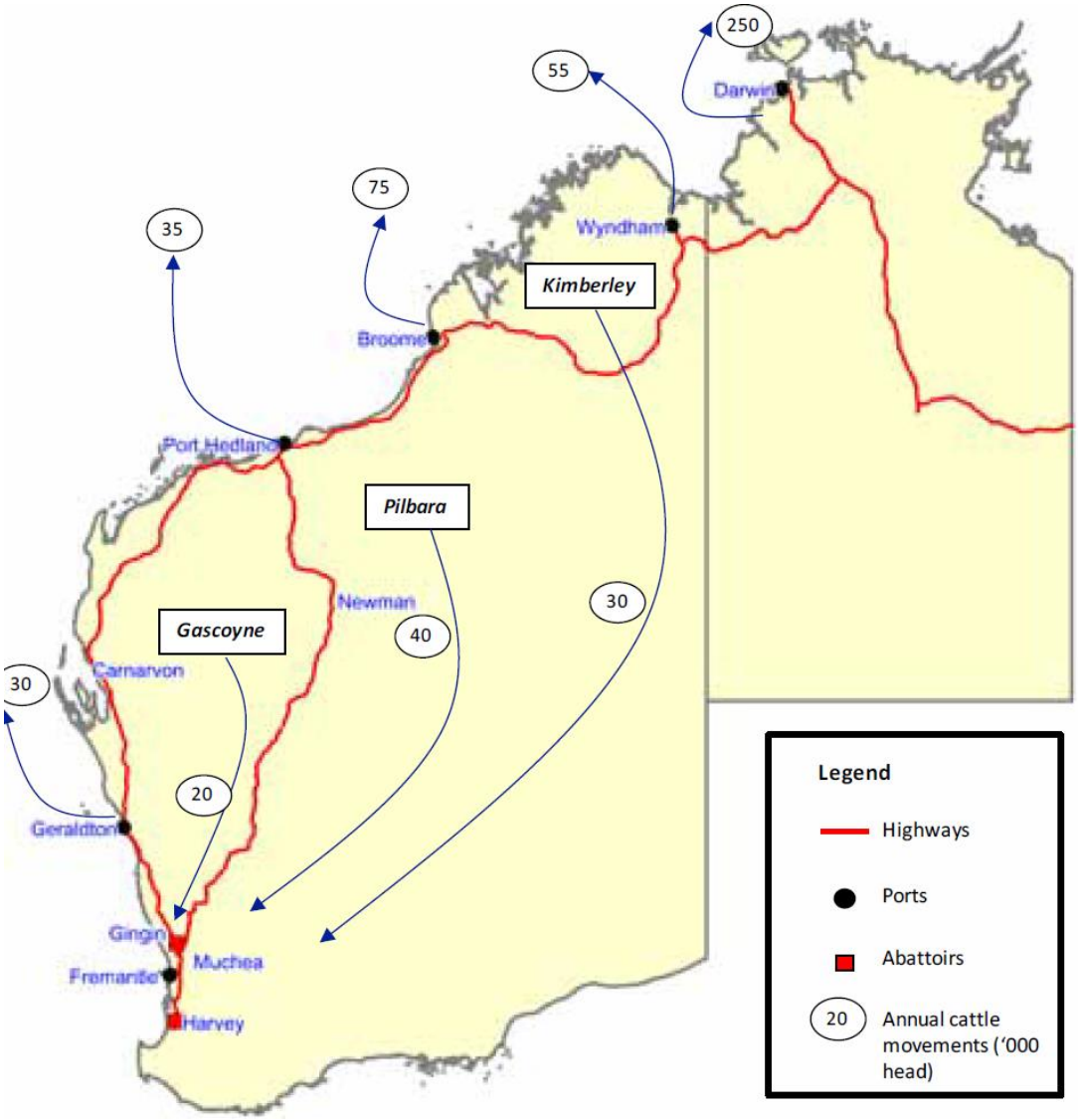


Figure 16 NW WA cattle production regions with indicative annual cattle movement numbers (RIRDC 2010)

DAFWA is undertaking a feasibility paper to determine the viability of establishing an abattoir north of Geraldton to service North West Australian slaughter trade.

Industry Vision

The Gascoyne Regional Investment Blueprint (Western Australia Department of Regional Development 2015), established a vision for the local pastoral industry summarised in Table 8 below. The vision includes a 71% increase in production value, driven by the establishment of irrigated pasture, feedlots and an abattoir. The blueprint considers a mobile abattoir as a possible lower-cost alternative for processing sheep, goats and cattle.

Table 8 2050 Vision for the Gascoyne Pastoral Industry (GDC 2015)

	2015	2050 Vision
Value of annual production	$35M	$60M
Employment	134	200
Feedlots	No	Yes
Irrigated pasture	No	Yes
Abattoir	No	Yes

3.2.3 2010 Study: Feasibility of establishing a northern Western Australian beef abattoir

In 2010 the Department of Food and Agriculture (WA) and the Rural Industries Research and Development Corporation (RIRDC) commissioned a preliminary study into the benefits and feasibility of establishing a beef processing capability to service the WA Rangelands cattle production industry. The study examined six potential abattoir locations, including Carnarvon.

The study showed that a Carnarvon based abattoir would generate substantial supply chain cost savings for cattle when compared to the nearest processing option (Harvey). Producers in the Gascoyne region would save an estimated 17c/kg, while producers further north in the Pilbara and Kimberly regions would also access freight savings. When compared with live export (via Geraldton to Asia) a Gascoyne producer would save an estimated 89c/kg if cattle were processed n Carnarvon and exported to Asia.

Of the six locations evaluated, Broome was considered to be the most suitable for establishing a new abattoir, followed by Derby. Locations further south, including the Gascoyne were less preferred compared to northern regions, where supply chain benefits were deemed to be higher. The study suggested that in more Southern regions such as Gascoyne, it may be more viable to extend existing processing operations to handle cattle, rather than seeking to establish a new comprehensive abattoir.

Overall, despite the significant potential benefits to regional beef producers, the study found that establishing an abattoir in Northern Western Australia would not be commercially viable, without a significant commitment from industry and governments. The main factors cited as affecting viability were:

- Lack of scale – cattle turnoff rates are low in relation to the needs of a modern abattoir (40K per annum)
- Seasonal variability of slaughter cattle supply
- Strongly competitive live export trade, and associated herd characteristics
- Remote locations affecting skilled labour availability

The study found that a processing chain featuring a new facility is not likely to be viable if it exists as a 'last resort' behind the live trade.

"The great challenge is for the industry to re-orient itself around a processing stream, and wean itself off live export dependence. This would require significant structural adjustment and the development of an agistment/fattening industry to underpin future diversification of marketing options and increased profitability for northern producers."

4. Challenges facing the Australian fruit and vegetable processing sector

In evaluating the feasibility of a fruit and vegetable processing plant it is important to have an understanding of the challenges facing the sector and how these issues can be avoided or overcome. This section provides a brief summary of the main challenges.

4.1 Low margins

Low profit margins represent the major overall challenge for Australian fruit and vegetable processing. Figure 17 below presents an indicative breakdown of the revenue share amongst supply chain participants for a $1.99 Australian made fruit juice.

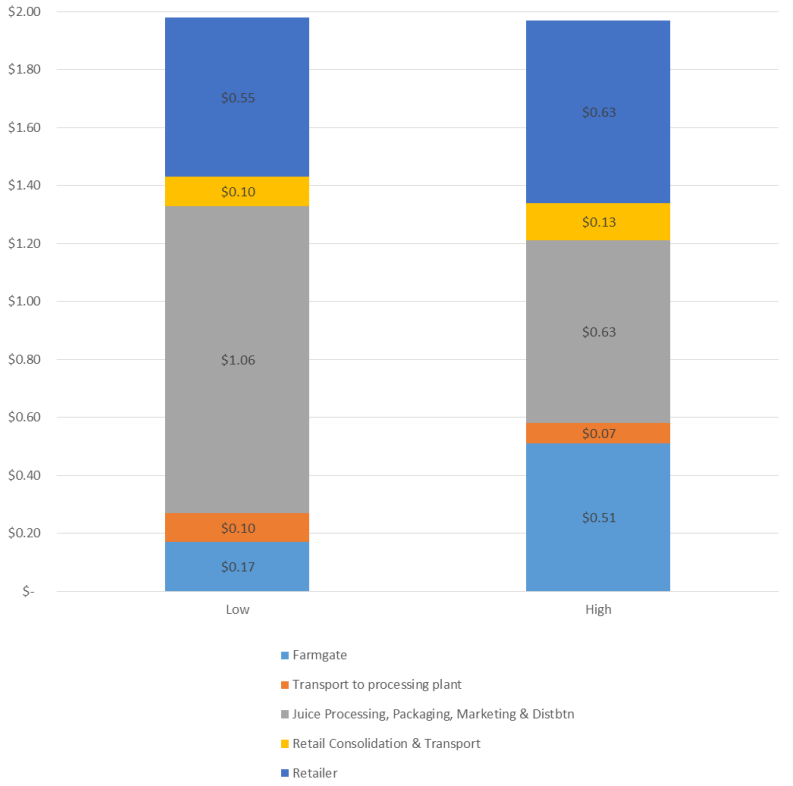


Figure 17 Share of retail dollar fruit juice (Retailworks 2012)

Low profit margins are caused by a combination of factors including:

- High production costs (labour and inputs)
- Competition from imported products
- Difficulty catering to changing consumer tastes and preferences

These factors are discussed further below.

4.2 Competition from imported products

Processed fruit and vegetable products can generally be imported into Australia for a considerably lower cost than locally processed products. While local consumers will generally pay a premium for Australian product, this premium is often insufficient to remain competitive.

Table 9 below provides the average price per kg for a range of processed fruit and vegetable products imported into Australia between July 2013 to May 2015. In some cases (e.g. Mango

pulp) the prices of imported processed product is near or below the cost of production in Australia.

Table 9 Average landed price of imports $/kg (sample size)

Row Labels	Dried	Pulp	Juice	Paste	Powder	Sauce
Banana	$14 (4)					
Mango	$8 (32)	$2 (30)	$3 (11)			
Papaya					$8 (4)	
Tomato				$3 (3)	$5 (16)	$4 (10)
Watermelon					$11 (2)	

Source: www.zauba.com

Consultation with local food processors operating in this market highlights the need to;

- differentiate the locally produced product (on the grounds of food safety, convenience, quality)
- target higher end markets (e.g. food service)
- target niche markets which are not dominated by imported products

4.3 Cost of production

Australian processors generally encounter higher input costs than competing countries. In particular processors cite higher labour, transport, energy and regulatory compliance costs.

4.4 Adapting to changing consumer tastes and preferences

An ongoing challenge in fruit and vegetable processing is adapting to changing consumer tastes and preferences for flavours, packaging etc. Many processing businesses are regularly forced to upgrade facilities and equipment to produce a more marketable product. However sometimes consumer sentiment can shift away from a product category as a whole, leaving processors unable to adjust. For example some fruit processing businesses cited a current shift in consumer sentiment away from fruit juice as a whole, due to higher sugar levels.

Within the fruit juice category flavour preferences are constantly changing. Listed below are the most popular flavours in new juice and nectar launches (Business Insights Ltd. / GNPD 2008)[5].

1. Orange
2. Apple
3. Mango
4. Pineapple
5. Peach
6. Banana
7. Grape
8. Strawberry
9. Lemon
10. Pomegranate
11. Passionfruit
12. Raspberry
13. Pear
14. Carrot
15. Cranberry
16. Blackcurrant
17. Cherry
18. Guava
19. Apricot
20. Blueberry

[5] http://edit.tetrapak.com/documentbank/TP_Magazine97_En.pdf

5. Introduction to multi-food processing

This section provides an introduction to multi-food processing, outlining the key challenges and benefits of adopting a multi-food processing approach.

5.1 What is a multi-food processing plant?

A multi-food processing plant is a facility which is capable of processing different food commodities, ranging from fruit, vegetables, meat and seafood. Compared to specialised (or single commodity) plants, multi-food processing facilities are customised to cater for different commodities. In most cases this means plants having additional specialised processes or functions for different commodities.

5.1.1 Benefits of multi-food processing

Multi-food processing has a range of benefits over conventional, single commodity processing, discussed below.

Sharing of plant and resources

Key plant services and infrastructure can be used for different processing methods. For example a plant may have separate fruit pulping and drying process lines, which share facilities and equipment for inbound storage, washing and sorting, waste disposal packaging etc. Furthermore staff resources can be shared across different process lines. In this way the costs of production can often be reduced.

Ability to produce products incorporating multiple commodities

Food commodities can be processed and combined into single products at the one facility e.g. canned soup with vegetables and meat. Incorporating multiple products in this way should allow for cost savings and additional value adding.

Catering for seasonal produce

Facilities can process different commodities throughout the year, according to the different seasonal peaks. This can enable plants to continue operating year round, avoiding costly seasonal closures.

Diversified income

Relying on a range of commodities, rather than just one, reduces risks associated with crop or market failure. Having a range of processing and marketing options is particularly valuable in food processing where profit margins are often thin, and subject to variations in commodity and input prices, exchange rates etc.

Ability to divert resources

Multi-food processing plants have the ability to divert resources to absorb damaged or excess commodities.

5.1.2 Challenges of multi-food processing

Additional cost and complexity

Developing and operating a multi-food processing plant is typically more expensive and complicated than a single commodity plant, due to additional features, equipment, skills, regulations etc.

Food safety

Additional levels of care and compliance are required when processing multiple food commodities, particularly to control allergens.

6. Processing options

This section examines the four broad processing options suitable for adding value to the regions produce:

- Value-adding to fresh produce
- Pulping and juicing
- Drying
- Extended shelf-life processing

Table 10 below provides a preliminary assessment of the suitability of individual commodities produced in the region for each processing option.

Table 10 Options analysis by product

	Value adding to fresh produce	Pulping and juicing	Drying	Extended shelf-life processing
AVOCADO		✓	✓	✓
BANANA		✓	✓	✓
GRAPES	✓	✓	✓	✓
GRAPEFRUIT		✓	✓	✓
MANGO	✓	✓	✓	✓
PAWPAW	✓	✓	✓	✓
ROCKMELON	✓	✓	✓	✓
WATERMELON	✓	✓	✓	✓
HONEYDEW MELON	✓	✓	✓	✓
BASIL	✓			
BEANS, STRINGLESS	✓			✓
CAPSICUM	✓		✓	✓
CHILLI	✓			
CUCUMBER	✓			✓
EGGPLANT	✓		✓	✓
PUMPKIN	✓			✓
PUMPKIN, BUTTERNUT	✓			✓
SWEETCORN	✓			
TOMATO	✓	✓	✓	
TOMATO, ROMA	✓	✓	✓	
TOMATO, CHERRY	✓	✓	✓	
ZUCCHINI	✓			✓
SEAFOOD			✓	✓
RED MEAT			✓	✓

Each processing option is discussed in further detail below, with an assessment of seasonal horticultural throughput, based on the most recent (2013) annual production statistics and the

suitability assumptions above. Throughput assessments are also based on an assumption that a processing plant will draw 20% of produce away from other markets.

6.1 Value adding to fresh produce

Produce can be packaged fresh either whole, or after undergoing some minor processing or value adding activities. These activities might include skin and seed removal and slicing to prepare the fresh product to a ready to eat state. Modified atmosphere or vacuum packaging can be used to extend the product shelf-life.

Table 11 Value adding to fresh produce summary

Produce	Process	Product options	Packaging options
• Mango • Melon • Grapes • Pumpkin • Capsicum • Beans • Eggplant	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Packaging, freezing, storage and dispatch	• Conveniences packs • Fruit or vegetable slices or pieces • Fruit salad	• Modified atmosphere • Vacuum packaging • Trays • Tubs • Bags

6.2 Pulping and juicing

Juice and pulp processing involves the extraction of fluid from fruit and vegetables. This can also include products such as jams and sauces.

Table 12 Pulping and juicing summary

Produce	Process	Product options	Packaging options
• Banana • Mango • Tomato • Capsicum • Melon • Pumpkin • Grapes	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Heat treatment • Fine pulping • Packaging, freezing, storage and dispatch	• Raw pulp • Raw juice	• Vacuum bags • Cartons

Figure 18 below suggests 11 horticultural commodities produced in the region are suitable for juice or pulp processing, including some of the major commodities such as mango, tomato, banana and melon varieties. Combined, these commodities provide for a relatively consistent seasonal throughput.

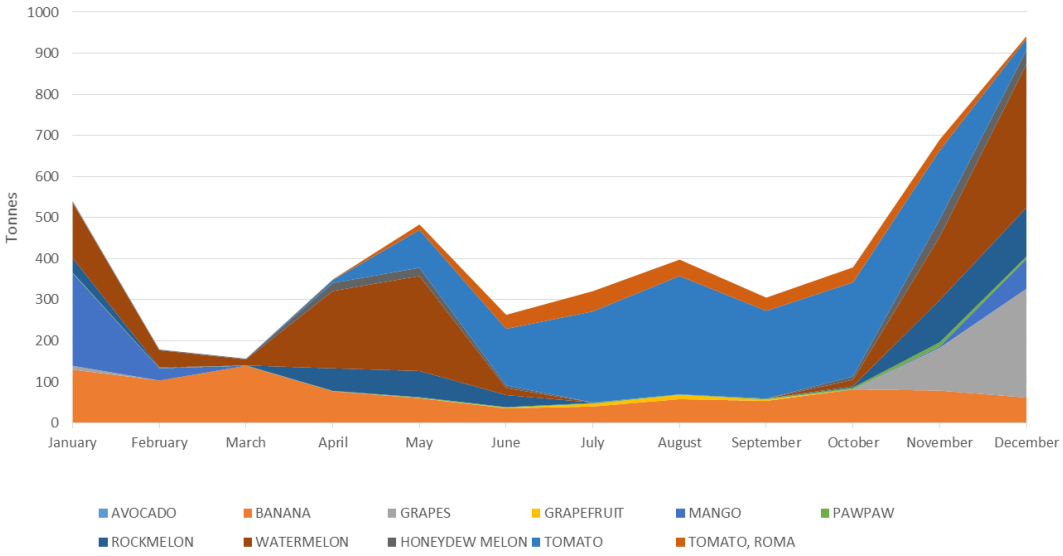


Figure 18 Juicing and pulping throughput

6.3 Drying

This is a method of food preservation that inhibits the growth of bacteria, yeasts, and mould through the removal of water (dehydration). Water is traditionally removed through evaporation (air drying, sun drying, smoking or wind drying), although electric food dehydrators or freeze-drying are used industrially to speed the drying process and ensure more consistent results.

Table 13 Drying summary

Produce	Process	Product options	Packaging options
• Banana • Mango • Tomato • Capsicum • Melon • Pumpkin • Grapes	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Sulphating • Dehydration • Packaging, freezing, storage and dispatch	• Dried or semi dried fruit or vegetable pieces	• Bags • Trays

Figure 19 below shows the potential throughput for a drying plant including 13 horticultural commodities, with a relatively consistent seasonal throughput.

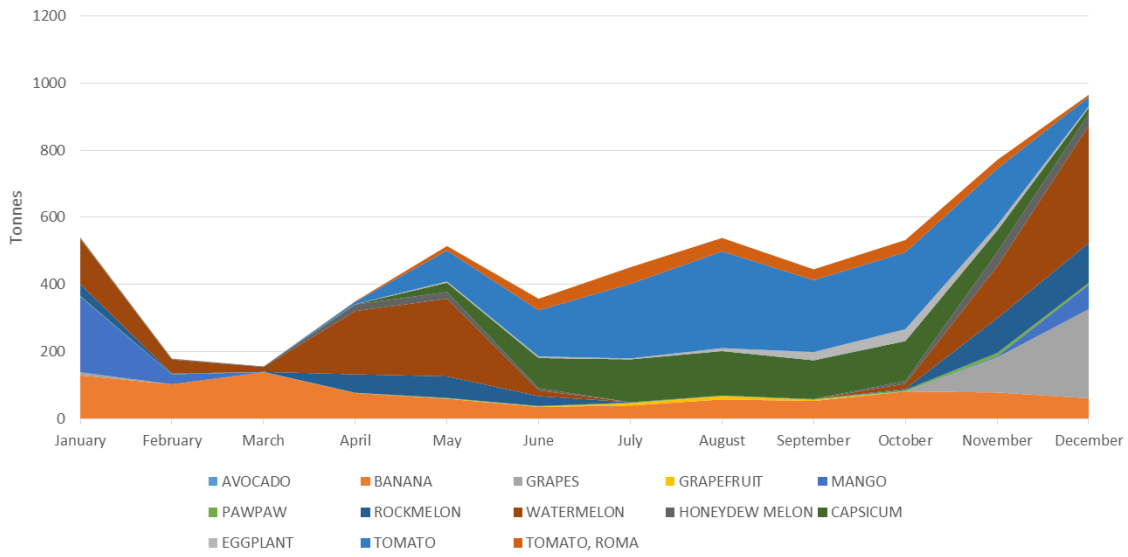


Figure 19 Drying throughput

6.5 Extended shelf-life processing

Extended shelf-life processing can include any process whereby contents are processed and sealed in an airtight container. This can also include processing meats and vegetables for products such as soup or baby food. The food industry is increasingly moving away from using cans or jars in preference to rectangular cartons and pouches.

Table 14 Extended shelf life processing summary

Produce	Process	Product options	Packaging options
• Banana • Mango • Tomato • Capsicum • Melon • Pumpkin • Grapes	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Addition of preserves, flavours and other additives • Cooking/evaporation/concentration • Packaging, freezing, storage and dispatch	• Soup • Sauce • Paste • Concentrate • Powder	• Cartons • Pouches • Tubes • Tubs • Bags • Jars

Figure 20 below shows that the large majority of commodities produced in the region are suitable for processing in some way into extended shelf-life products.

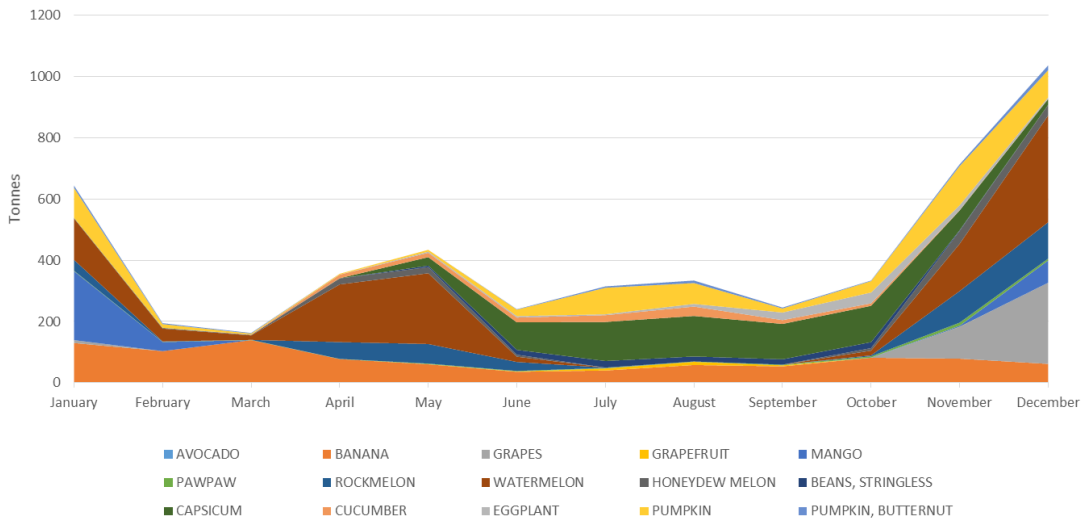


Figure 20 Extended shelf-life processing

7. Plant design options

A key advantage of developing a multi-food processing plant is the ability for different process lines to share services and equipment (as outlined in Section 5.1.1).

Given the different processing options outlined above, GHD considers the plant process map outlined in Figure 21 represents a logical design, with a base option (orange) and optional additional process lines for drying (blue) and extended shelf-life processing (green). Note this process map is indicative only and would likely change considerably depending on the specific products to be produced.

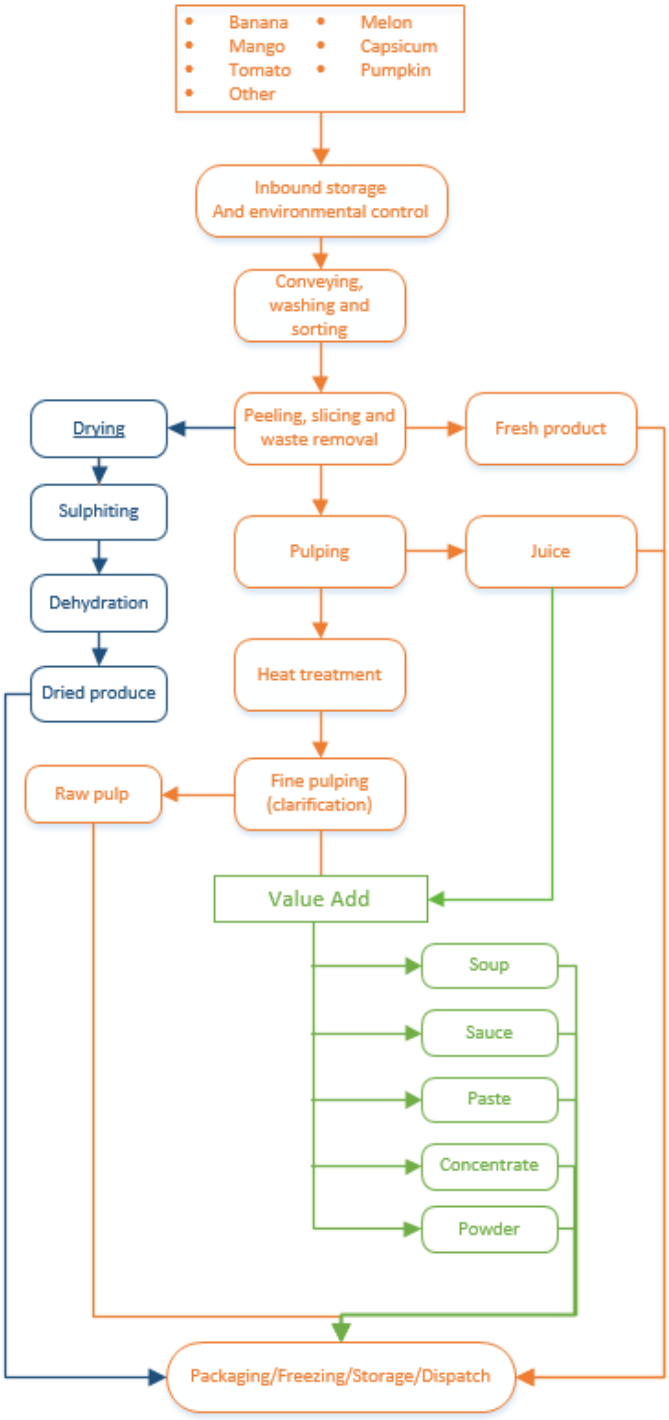


Figure 21 Indicative plant process map (with options)

Within the above design, there are multiple variations which could be developed depending on the mixture of process lines to be installed. This study evaluated the three plant options outlined in Table 15.

Table 15 Plant options

Option	Value adding to fresh product	Pulping and juicing	Drying	Extended shelf-life processing
Plant option 1:	✓	✓		
Plant option 2:	✓	✓	✓	
Plant option 3	✓	✓	✓	✓

Each of the above plant design options could be established on a range of potential sites within the region, as outlined in Section 8 below.

8. Site options and evaluation

Consultation in the region identified the following sites as being suitable for developing a plant.

- Site A: The Department of Agriculture land on North West Highway (new plant)
- Site B: Cornish Road industrial land (new plant)
- Site C: Babbage Island Factory (upgrade to existing seafood plant)

This section provides a broad overview of each site and evaluation of suitability (see Section 8.1.4)

8.1.1 Site A: Department of Agriculture Land

DAFWA owns and operates the Carnarvon Research Facility which covers 65 hectares close to the Gascoyne River in the plantation district. The facility is located on the corner of South River Road and Research Road along the southern bank of the Gascoyne River, 10 kilometres east of Carnarvon CBD. The facility is used for research trials of many fruits and vegetables; however the site includes a proportion of land which is not currently being utilised for horticultural trials. These areas front the North West Coastal Highway, with approximately 15Ha to the East of Research Road and approximately 9.4 Ha to the West (see Figure 22). These areas are considered less suitable for horticultural production and therefore more appropriate for alternative development.

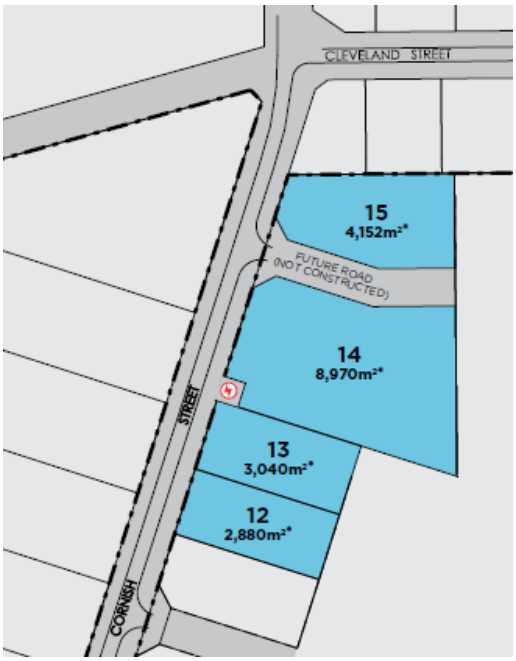
Figure 22 Satellite image of site A

Figure 23 Site A: Eastern frontage off Research Road

8.1.2 Site B: Cornish Street Industrial Land

The second potential site for the facility (Site B) is an area of industrial land currently for sale off Cornish Street and Cleveland Street. Bordering the airport, the site is approximately 4km east of Carnarvon and a similar distance to the plantation district. Four separate allotments are currently for sale, ranging in size from 2,880m^2 to 8,970m^2. Advertised prices for these allotments are $144,000 to $359,000 respectively (Figure 25). The land is currently zoned light industrial, and has electricity and town water available. Additional industrial land is likely to become available in this area.

Figure 24 Satellite image of site B



Lot	Address	Land Size	Price	Type
12	Cornish St	2,880sqm	$144,000	Industrial
13	Cornish St	3,040sqm	$152,000	Industrial
14	Cornish St	8,970sqm	$359,000	Industrial
15	Cornish St	4,152sqm	$208,000	Industrial

Figure 25 Site B: location, advertising and price

8.1.3 Site C: Babbage Island Factory

Norwest Seafood (recently sold to Style Limited) operate the Babbage Island factory on Binning Road about 8km west of Carnarvon. The facility is currently used predominately for processing prawns for the local, national and export markets. Usually only operating from April to October, the facility has substantial excess capacity which could be used to support alternative food processing ventures. Consultation with the owners of the facility suggests they would willingly consider any opportunities to utilise the facility for other means.

The plant is aging however very functional and suitable for its current purposes. With a relatively modest investment the plant could be upgraded and adapted for multi-food processing purposes, including pulping or drying.

Some of the key features of the site include:

- Excess floor space for processing including some preliminary equipment which could be utilised.
- Excess freezing capacity and contact freezing equipment

- Two freezers currently operate to produce a total of 240Kwh of rejected heat. This heat could be readily utilised for drying fruit, using heat transfer techniques
- An established retail outlet, offering factory door sale
- Excess capacity to house workers at the nearby living quarters

The overwhelming advantage of the Babbage Island facility is the avoided costs of establishing a new plant including land acquisition, approvals, site works, utilities connections and plant construction.

Figure 26 Site C: aerial view

Figure 27 Site C: Front entrance and parking

Figure 28 Site C: factory floor

Figure 29 Site C: factory floor

Figure 30 Site C: Freezing capacity

Figure 31 Site C: Refrigeration units

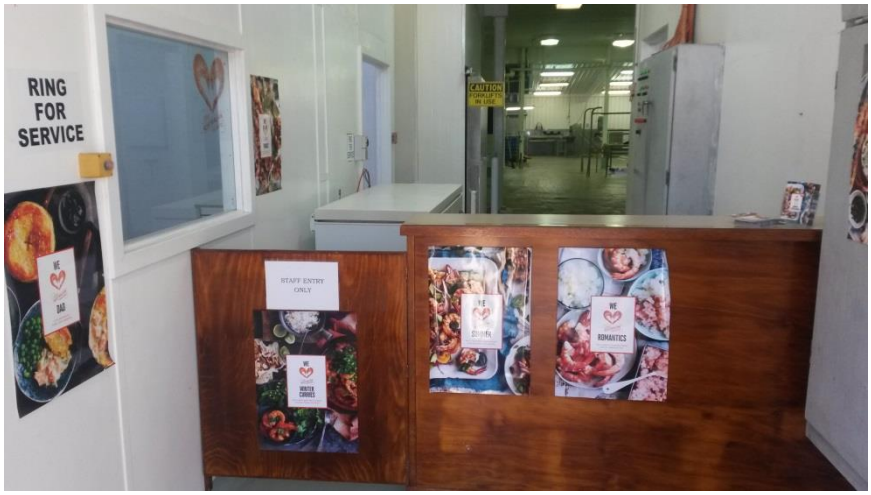


Figure 32 Site C: Retail outlet

Figure 33 Site C: worker accommodation

8.1.4 Site evaluation

Table 16 below provides a high level evaluation of the three sites based on a number of criteria.

Table 16 Multi-criteria site evaluation

The ideal site for the plant would meet the following criteria	Site A Dept. of Ag	Site B Cornish Rd	Site C Babbage Island
• Have an appropriate land tenure;	✓ Crown land	✓✓✓ Freehold	✓✓✓ Freehold
• Be accessible to road transport bringing in produce and taking away the finished product (roads sealed, no inundation);	✓✓✓ Highly accessible	✓✓✓ Highly accessible	✓✓ Suitably accessible
• Be within a relatively short distance of the main highways and located to avoid lengthy road access through urban areas	✓✓✓ Frontage to NW Coastal Hwy	✓✓ 2km from NW Coastal Hwy via industrial precinct	✓ Approximately 8.5 Km from NW Coastal Hwy via Babbage Island Road and Robinson Street
• Be away from sensitive sites (e.g. schools, residential areas);	✓✓✓ Good separation	✓✓ Moderate separation	✓✓✓ Good separation
• Be distant enough from other food production and processing enterprises to ensure that flies, vermin, dust and pesticides do not impact the day to day operations;	✓✓ Plantations nearby	✓✓✓ Good separation	✓ Seafood processing within facility
• Suitably zoned for operating a food processing plant;	✓ Reserved block – crown reserve with management restrictions. Also zoned as intensive horticulture (experimental block)	✓✓✓ Zoned general industry	✓✓ Crown Allotment (Blank zone) – Department of Lands controls through agreements
• Have a land area sufficient for the envisaged operation with space for future expansion;	✓✓✓ Sufficient land available	✓✓✓ Sufficient land available	✓✓✓ Sufficient land available

The ideal site for the plant would meet the following criteria	Site A Dept. of Ag	Site B Cornish Rd	Site C Babbage Island
• Be within ready access to a supply of potable water or can be made potable efficiently	✓✓ Irrigation water available	✓✓✓ Irrigation and town water available	✓✓✓ Bore water available
• Be close to a supply of electricity, and gas if required;	✓ Electricity and gas available in area	✓✓ Electricity and gas available for connection	✓✓✓ Electricity connected and gas storage on site
• Be close to public waste water systems or be large enough and suitable for establishment of a waste water treatment system;	✓✓✓ Large enough to establish waste water treatment system	✓✓✓ Close to public waste water systems and with sufficient space to establish onsite treatment system	✓✓✓ Existing waste water system on site could be upgraded
• Be in relatively close proximity to a waste disposal facility;	✓✓✓ Close to Browns Range Waste Management Facility	✓✓✓ Close to Browns Range Waste Management Facility	✓✓ Further distance from Browns Range Waste Management Facility
• Be protected by an all-round buffer zone including landscaping;	✓✓✓ Large block with substantial land for buffer	✓✓ Smaller block with sufficient land for buffer	✓✓✓ Buffer already in place
• Not be prone to flooding	✓✓ On floodplain with levy in place	✓✓✓ Not prone to flooding	✓✓✓ Not prone to flooding
Score	30	35	32

9. Financial analysis

This section evaluates the financial viability of each of the different plant and site options (scenarios) summarised in Table 17.

Table 17 Summary of scenarios

Option	Value adding to fresh product	Pulping and juicing	Drying	Extended shelf-life processing	Greenfield site	Babbage Island Site
1: Base option - greenfield	✓	✓			✓	
2: Extended option - greenfield	✓	✓	✓		✓	
3: Full option - greenfield	✓	✓	✓	✓	✓	
4: Base option - Babbage Island	✓	✓				✓
5: Extended option - Babbage Island	✓	✓	✓			✓
6: Full option - Babbage Island	✓	✓	✓	✓		✓

The analysis includes cost estimates[6] (CapEx and OpEx) for developing the plant based on the desktop analysis of necessary inputs, consultation with suppliers and other processors and available information from previous developments.

Estimates are indicative only and provide a starting point upon which potential investors can undertake further analysis and due diligence. A processing plant would need to be more fully scoped in order to provide a rigorous financial analysis.

The financial analysis evaluates each of the options in terms of the discounted Net Present Value (NPV) of returns over a 20 year investment timeframe, discounted at 7%.

[6] *All cost estimates have an indicative possible variance of +40%, - 10%.*

9.1 Capital expenditure (CapEx)

The following capital expenditure items are estimated for each of the modelled scenarios.

Table 18 CapEx estimates[7]

Item	Greenfield Site			Babbage Island Site			Assumptions and specifications
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP	
Land Purchase	300,000	300,000	300,000				• Assumes land is already serviced with electricity, water and gas (if necessary)
Design. Approvals and project management	200,000	200,000	200,000	30,000	30,000	30,000	• Usually 12% to 14% of project cost for the facility.
Site works	300,000	300,000	300,000	50,000	50,000	50,000	• Assuming approximately 1600m2 of sealed road/parking and some additional surrounding works. Does not include on-site storage ponds.
Utility connections	50,000	50,000	50,000				• Assumes services are available to site boundary. • No provision for transformers.
Construction	1,000,000	1,000,000	1,000,000	75,000	75,000	75,000	• Framed panel construction (estimated at 1800/M^2) • Chiller, freezer, dry goods store, corridors: 200M^2 • Processing floor 200 M^2 • Office and amenities 100 M^2

[7] Assume that fork lifts and other non-fixed equipment is leased not considered as capital items.

Item	Greenfield Site			Babbage Island Site			Assumptions and specifications
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP	
							• Minimum 3m height for processing area with lean-to additions at sides for non-processing activity.
Conveying, washing and sorting	200,000	200,000	200,000	200,000	200,000	200,000	
Disintegration, slicing and waste removal	300,000	300,000	300,000	300,000	300,000	300,000	
Preparing fresh product	200,000	200,000	200,000	200,000	200,000	200,000	
Pulping and juicing							• Includes equipment, electrical connections, conveyors and work tables, scales, hoses and pumps • Cost estimates for pulping and juicing equipment provide by GEA Australia, equipment has a capacity or 1.5t/hour • Cost estimates for extended shelf-life packaging equipment provide by GEA Australia, equipment has a capacity of 2-4t/hour • Other estimates based on consultation with established processors
Macerator	80,000	80,000	80,000	80,000	80,000	80,000	
Decanter	250,000	250,000	250,000	250,000	250,000	250,000	
Separation	200,000	200,000	200,000	200,000	200,000	200,000	
Heat treatment	300,000	300,000	300,000	300,000	300,000	300,000	
Pulp and juice packaging (1000L vessel and aseptic filler)	500,000	500,000	500,000	500,000	500,000	500,000	
Drying							
Sulphiting		100,000	100,000		100,000	100,000	
Dehydration		100,000	100,000		100,000	100,000	
Dried product packaging		100,000	100,000		100,000	100,000	
Extended shelf life processing			100,000			100,000	
Extended shelf life packaging							
Concentrator			1,600,000			1,600,000	
Pasteuriser and			800,000			800,000	

Item	Greenfield Site			Babbage Island Site			Assumptions and specifications
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP	
de-aeration tanks							
Packaging			100,000			100,000	
Waste management	50,000	50,000	50,000	20,000	20,000	20,000	• Solid waste collected by sieve with water treated and disposed to sever. • Minor upgrades to Babbage Island waste management facilities
Tunnel Freezer	300,000	300,000	300,000	150,000	150,000	150,000	• 2t capacity. GEA Australia. • Lower capacity required at Babbage Island, due to existing contact freezer
Chiller and cold store	90,000	90,000	90,000	40,000	40,000	40,000	• Plant and equipment • Minor upgrade to Babbage Island
Cleaning and sanitisation	250,000	250,000	250,000	250,000	250,000	250,000	• Cleaning and sanitisation system and fit out
Lab room	20,000	20,000	20,000	5,000	5,000	5,000	• Equipment and fit out
Office and amenities	50,000	50,000	50,000	20,000	20,000	20,000	• Furniture, equipment and fit out
Inwards good store	40,000	40,000	40,000	20,000	20,000	20,000	• Loading dock equipment
Contingency	468,000	498,000	748,000	269,000	299,000	549,000	• 10% of total CapEx
TOTAL CAPEX	**$5,148,000**	**$5,478,000**	**$8,228,000**	**$2,959,000**	**$3,289,000**	**$6,039,000**	

9.2 Operational expenditure (OpEx)

GHD estimated the following operational expenditure (excluding product purchase costs) for each of the modelled scenarios.

Table 19 OpEx estimates

Item	Greenfield Site			Babbage Island Site			Assumptions and specifications
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP	
Insurance	$92,664	$98,604	$148,104	$53,262	$59,202	$108,702	1.8% of total CapEx
Depreciation Building	$30,000	$30,000	$30,000	$2,250	$2,250	$2,250	3% of Construction costs
Depreciation Services	$12,500	$12,500	$12,500	$5,250	$5,250	$5,250	5% of Services costs
Depreciation Equipment	$190,400	$211,400	$386,400	$174,300	$195,300	$370,300	7% of equipment costs
Consumables	$15,000	$20,000	$25,000	$15,000	$15,000	$15,000	Packaging, stationary, lubricants etc.
Packaging	$1,092,647	$1,108,655	$1,114,020	$1,092,647	$1,108,655	$1,114,020	10% of product value
Ingredients and additives	$20,000	$40,000	$100,000	$20,000	$40,000	$100,000	Needs to be further verified
Electricity	$200,000	$250,000	$300,000	$200,000	$250,000	$300,000	17c/kWh
Water	32,000	38,400	44,800	32,000	38,400	44,800	16,0000 KL per annum @ $2.00/KL (average for WA food processing businesses) 10% higher for each additional process line.
Gas	$60,000	$70,000	$80,000	$60,000	$70,000	$80,000	
Maintenance Parts	$40,000	$50,000	$60,000	$40,000	$40,000	$40,000	Replacement parts
Forklift hire	$25,740	$25,740	$34,320	$25,740	$25,740	$34,320	$8,580 per annum (2.5L LPG), Base option = 2 forklifts, + 1 for

Item	Greenfield Site			Babbage Island Site			Assumptions and specifications
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP	
							each additional process line.
Pallet and container hire	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	1000 pallets @ $0.1420 per day + containers etc.
Procurement, sales, marketing and admin	60,000	70,000	80,000	25,000	35,000	50,000	Website, advertising, trade shows and marketing meetings
Labour (FTE)	20	30	40	20	30	40	Management, admin, marketing (5) Processing lines (15 + 10 per additional line)
Total Labour Cost	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000 per FTE
Total OpEx	**$3,370,952**	**$4,099,559**	**$5,180,825**	**$3,119,710**	**$3,959,057**	**$5,030,323**	

9.3 Throughput volume and purchase cost

Indicative input volume was estimated based on the facility receiving 20% of all banana, mango, tomato, melon and pumpkin produced in the 2012/13 financial year. Consultation found that waste and downgrade levels often exceed 30%, however a proportion of this waste is not likely to be suitable for processing.

Consultation found that $1 per kg was a generally acceptable price across commodities for disposal of damaged or downgraded product. This price is considered generally sufficient to encourage producers to deliver damaged or downgraded product to the processing facility, rather than disposing as waste or delivering to Perth for discounted sale. The required purchase price is likely to vary each year depending on the local production season (levels of production and quality) and the prices offered at the Perth markets.

The required quality of produce (and therefore purchase price) will vary depending on the processing method. For example lower quality produce will be suitable for pulping while higher quality produce would be required for value added fresh produce.

The facility has been modelled on operating for 240 days per annum (48 weeks per year, 5 days per week) with 8 hour shifts per day. With the facility receiving 7,178 tonnes per annum this equates to the facility receiving 30 tonnes per operating day or 3.75 tonnes per operating hour.

Table 20 estimated throughput volume and purchase costs

Commodity	Input Produce[8] (tonnes)	Purchase price	Produce purchase costs
Banana	1,144	Average $1 per kg purchase price across all commodities	$1,144,135
Mango	414		$414,006
Tomato	2,730		$2,730,298
Melon	2,117		$2,117,013
Pumpkin	772		$772,225
Total	**7,178**		**$7,177,676**
Days operating per annum	240 (48 weeks per year, 5 days per week)		
Shift length	8 hours		
Average daily throughput	30 tonnes		
Average hourly throughput	3.75 tonnes		

9.3.1 Managing seasonal variability

Figure 34 below shows the projected daily throughput over the year, assuming the plant operates for 20 days per month and accepts 20% of the bananas, mangoes, tomatoes, melons and pumpkins produced.

[8] Equates to 20% of product produced in 2012/13

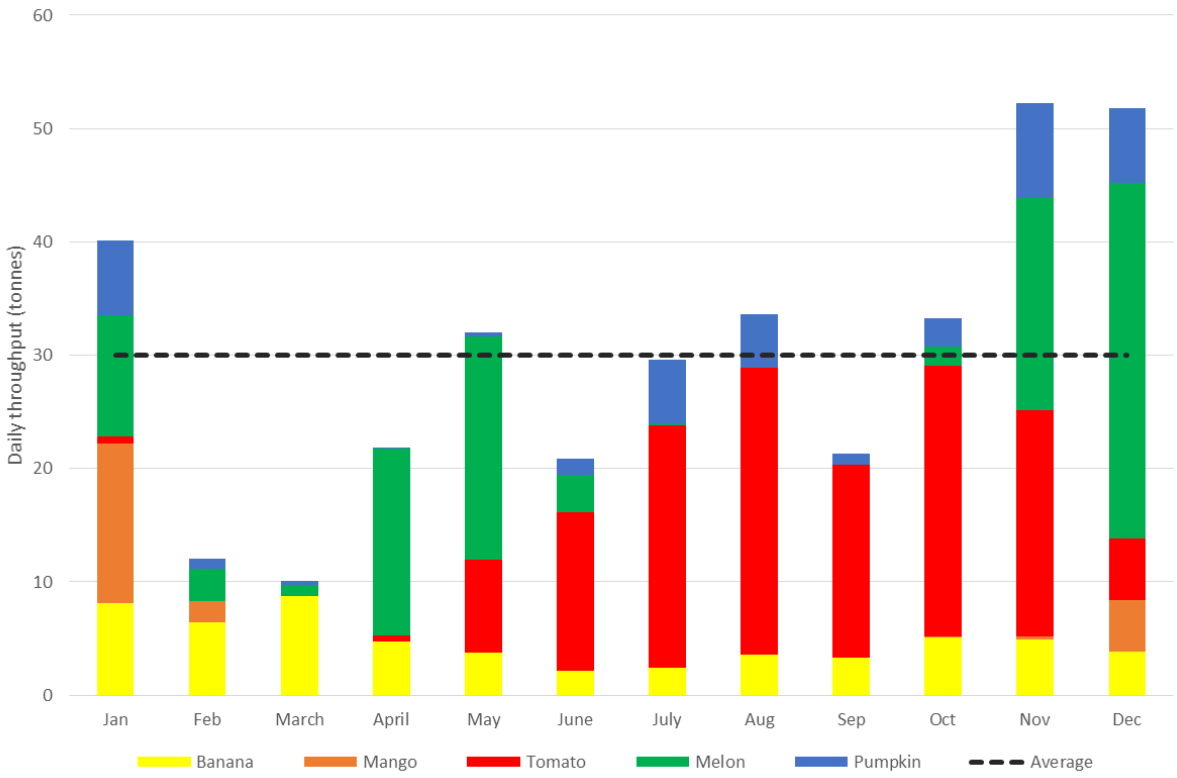


Figure 34 Projected daily throughput by commodity

The seasonal variation in throughput (ranging from 10 tonnes per day in March to 52 tonnes per day in November and December) could be reduced significantly by altering the level produce purchased, i.e. purchasing more product when the plant is running below capacity and less product if the plant is running at full capacity.

Similarly plant could alter its staffing levels and/or operational times to cater for the projected throughput. Figure 35 below depicts how closing the plant for 4 weeks during periods of low throughput (February and March) while proportionally increasing the days operation during other times (i.e. implementing enforced leave), helps to significantly reduce the seasonal variation in daily throughput. Food processing businesses regularly operate non-stop during peak harvest periods.

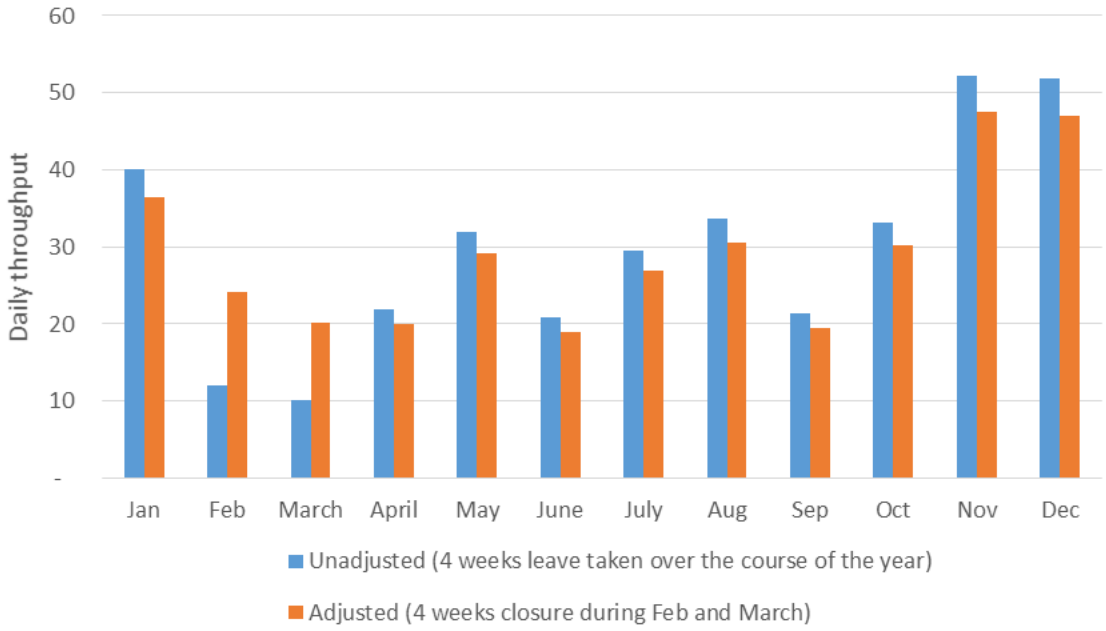


Figure 35 Daily throughput with and without plant closure

9.4 Processed products, recovery rates and output volumes

An average of 20% of all input produce is assumed to be discarded following purchase due to a range of defects (e.g. immaturity, disease, discolouration etc.). This figure was arrived at following consultation with processors who cited the need for ongoing sorting and occasional disposal of whole batches following contamination or quality issues.

The remaining produce is assumed to be directed evenly amongst the available processing options, as per Table 21 below, with the exception of the value adding to fresh produce line, which is assumed to only process the top 20% of all incoming produce. In reality the operator of the facility would have some flexibility to operate different processing options at different levels in order to meet the market demand (or specific orders) and thereby maximise revenue.

Table 21 Proportion of total input directed to each processing option

Item	Base option	+ drying	+ drying + ESLP
Waste	20%	20%	20%
Value adding to fresh produce	20%	20%	20%
Pulping	60%	30%	20%
Drying	0%	30%	20%
Extended shelf life processing	0%	0%	20%

Table 22 below presents indicative products and recovery rates for each commodity under each of the processing options, and the resulting output volumes.

Note that each of the input commodities can be processed via any of the processing options, with the following exceptions

- bananas and melons are not considered suitable for extended shelf-life processing;
- Tomatoes are not considered suitable for value adding to fresh produce;
- Pumpkin are not considered suitable for drying;

In these instances the input volume has been diverted equally amongst the other processing options.

Table 22 Estimated recovery rates and output volumes

Process	Input commodity	Indicative product	Indicative recovery rate	Output (tonnes)		
				Base option	+ drying	+ drying + ESLP
Value adding to fresh produce	Banana	Convenience packs	95%	217	217	290
	Mango	Frozen cheeks or diced	60%	50	50	50
	Tomato	NA	NA	0	0	0
	Melon	Diced tubs or bags	60%	254	254	339
	Pumpkin	Diced bags	60%	93	162	124
Pulp	Banana	Frozen pulp in bags	60%	412	206	183
	Mango		50%	124	62	41
	Tomato		50%	1092	546	364
	Melon		40%	508	254	226
	Pumpkin		50%	232	174	103
Dried product	Banana	Dried fruit or chips in bags or tubs	10%	0	34	31
	Mango		10%	0	12	8
	Tomato		10%	0	109	73
	Melon		5%	0	32	28
	NA		NA	0	0	0
Extended shelf life product	Banana	NA	NA	0	0	0
	Mango	Jam or sauce	20%	0	0	17
	Tomato	Soup or Paste	20%	0	0	146
	Melon	NA	NA	0	0	0
	Pumpkin	Soup	20%	0	0	41
TOTAL	(Tonnes)			2,982	2,113	2,062

9.5 Prices received and sales revenue

Table 23 below shows indicative retail and ex processing plant prices for processed products. Ex-plant (wholesale) prices were estimated based on an assumption the processor will receive a price representing 60% of the final retail sale price. Sensitivity analysis was also undertaken for low (50%) and high (70%) price scenarios.

Table 23 Indicative retail and ex plant prices

Process	Input	Indicative product	Indicative retail price ($/Kg)	Indicative ex-plant price ($/kg)			*Source*
				Low (50%)	Medium (60%)	High (70%)	
Value adding to fresh produce	Banana	Convenience packs	$5.5	$2.75	$3.30	$3.85	http://shop.coles.com.au/online/national/coles-fresh-bananas---red-tipped-eco-loose
	Mango	Frozen cheeks or diced	$8	$4.00	$4.80	$5.60	http://shop.coles.com.au/online/national/coles-fruit-mango-diced-frozen
	Tomato	NA					
	Melon	Diced tubs or bags	$15	$7.50	$9.00	$10.50	http://shop.coles.com.au/online/national/fruit-salad-3-melon-mix-prepacked-1257002p
	Pumpkin	Diced bags	$7.86	$3.93	$4.72	$5.50	http://shop.coles.com.au/online/national/coles-fresh-diced-butternut-pumpkin-prepacked
Pulp	Banana	Frozen pulp in bags	$5.5	$2.75	$3.30	$3.85	http://www.frozberries.com.au/products_-_wa.html
	Mango		$7.25	$3.63	$4.35	$5.08	http://www.frozberries.com.au/products_-_wa.html
	Tomato		$5.5	$2.75	$3.30	$3.85	*Consultation with wholesalers*
	Melon		$5.5	$2.75	$3.30	$3.85	*Consultation with wholesalers*
	Pumpkin		$5.5	$2.75	$3.30	$3.85	*Consultation with wholesalers*
Dried product	Banana	Dried fruit in bags	$10	$5.00	$6.00	$7.00	http://shop.coles.com.au/online/national/banana-chips-dried-prepacked
	Mango		$55	$27.50	$33.00	$38.50	http://shop.coles.com.au/online/national/fruit-for-life-no-sugar-added-mango

Process	Input	Indicative product	Indicative retail price ($/Kg)	Indicative ex-plant price ($/kg)			*Source*
	Tomato		$25.55	$12.78	$15.33	$17.89	http://shop.coles.com.au/online/national/tomatoes-semi-dried
	Melon		$3	$35.00	$42.00	$49.00	http://www.tropicalharvestqld.com.au/products/dried-rockmelon
	Pumpkin		NA				
Extended shelf life product	Banana	NA	NA				
	Mango	Jam or sauce	$20	$7.25	$8.70	$10.15	http://allprices.com.au/masterfoods-chutney-mango/
	Tomato	Soup or Paste	$9.7	$4.85	$5.82	$6.79	http://shop.coles.com.au/online/national/leggos-tomato-paste-135713p
	Melon	NA					
	Pumpkin	Soup	$8.3	$4.15	$4.98	$5.81	http://shop.coles.com.au/online/national/campbells-simply-soup-butternut-pumpkin

Table 24 below presents the estimated sales revenue based on the modelled sales volume multiplied by the indicative ex-plant price received. These estimates factor in a 6% dump of processed products (old or damaged stock), based on consultation with existing processors.

Table 24 Estimated sales revenue (medium price)

	Item	Base option	+ drying	+ drying + ESLP
Value adding to fresh produce	Banana	$674,330	$674,330	$899,107
	Mango	$224,159	$224,159	$224,159
	Tomato	$ -	$ -	$ -
	Melon	$2,149,191	$2,149,191	$2,865,588
	Pumpkin	$410,797	$718,894	$547,729
Pulp	Banana	$1,277,678	$638,839	$567,857
	Mango	$507,861	$253,931	$169,287
	Tomato	$3,387,753	$1,693,877	$1,129,251
	Melon	$1,576,073	$788,037	$700,477
	Pumpkin	$718,633	$538,974	$319,392
Dried product	Banana	$ -	$193,588	$172,078
	Mango	$ -	$385,274	$256,849
	Tomato	$ -	$1,573,765	$1,049,177
	Melon	$ -	$1,253,695	$1,114,395
	Pumpkin	$ -	$ -	$ -
Extended shelf life product	Banana	$ -	$ -	$ -
	Mango	$ -	$ -	$135,430
	Tomato	$ -	$ -	$796,635
	Melon	$ -	$ -	$ -
	Pumpkin	$ -	$ -	$192,797
TOTAL		**$10,926,476**	**$11,086,554**	**$11,140,209**

9.6 Financial performance

Table 25 below presents the modelled financial performance of the facility for each of the development scenarios.

Table 25 Modelled financial performance (Medium price received 60% of final retail price)

Item	Greenfield Site			Babbage Island Site		
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Initial CapEx	$5,148,000	$5,478,000	$8,228,000	$2,959,000	$3,289,000	$6,039,000
OpEx	$3,370,952	$4,099,559	$5,180,825	$3,119,710	$3,959,057	$5,030,323
Produce Purchase Costs	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676
TOTAL ANNUAL COSTS	$10,548,628	$11,277,236	$12,358,501	$10,297,386	$11,136,734	$12,207,999
Sales revenue	$10,926,476	$11,086,554	$11,140,209	$10,926,476	$11,086,554	$11,140,209
Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171

9.6.1 Sensitivity and breakeven analysis

Below is an analysis of how annual profit margins and overall NPV will vary under different cost and price scenarios. Also presented are the breakeven values required to return a positive NPV.

Table 26 Sensitivity to price received

	Item	Greenfield Site			Babbage Island Site		
		Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Modelled scenario • Medium price received – 60% of final retail price)	Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
	NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171
High price received • 70% of final retail price	Annual Profit	$2,016,820	$1,346,562	$318,420	$2,142,322	$1,487,064	$468,922
	NPV	$14,670,126	$7,887,400	-$4,613,966	$17,928,199	$11,290,364	-$1,114,408
Low price received • 50% of final retail price	Annual Profit	-$1,261,123	-$1,979,404	-$3,023,643	-$1,135,621	-$1,838,902	-$2,873,141
	NPV	-$16,992,949	-$24,239,554	-$36,896,404	-$13,734,877	-$20,836,590	-$33,396,845
Breakeven	% of final retail price	61%	65%	73%	59%	63%	71%

Table 27 Sensitivity to produce purchase price

	Item	Greenfield Site			Babbage Island Site		
		Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Modelled scenario • Medium average cost of produce ($1 per Kg)	Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
	NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171
High produce purchase cost	Annual Profit	-$1,057,687	-$1,751,957	-$2,788,147	-$932,185	-$1,611,455	-$2,637,645
• $1.2 average	NPV	-$15,027,870	-$22,042,536	-$34,621,644	-$11,769,798	-$18,639,572	-$31,122,085
Low produce purchase cost	Annual Profit	$1,813,384	$1,119,114	$82,923	$1,938,886	$1,259,616	$233,425
• $0.8 average	NPV	$12,705,047	$5,690,382	-$6,888,726	$15,963,120	$9,093,346	-$3,389,168
Breakeven	$ per kg average	$0.98	$0.88	$0.70	$1.03	$0.93	$0.75

Table 28 Sensitivity to OpEx

	Item	Greenfield Site			Babbage Island Site		
		Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Modelled scenario	Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
• Medium OpEx	NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171
High OpEx	Annual Profit	-$296,342	-$1,161,481	-$2,415,641	-$145,739	-$992,879	-$2,235,038
• +20%	NPV	-$7,673,709	-$16,338,878	-$31,023,444	-$4,173,181	-$12,664,480	-$27,233,133
Low OpEx	Annual Profit	$1,052,039	$528,639	-$289,583	$1,152,440	$641,040	-$169,181
• - 20%	NPV	$5,350,886	-$13,276	-$10,486,926	$8,366,503	$3,118,254	-$7,278,120
Breakeven	% change from modelled	-4%	-20%	-40%	7%	-12%	-35%

Table 29 Sensitivity to CapEx

	Item	Greenfield Site			Babbage Island Site		
		Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Modelled scenario • Medium CapEx	Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
	NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171
High CapEx • +20%	Annual Profit	$359,316	-$336,142	-$1,382,233	$492,698	-$187,760	-$1,223,850
	NPV	-$2,302,671	-$9,390,494	-$22,579,249	$1,440,681	-$5,502,251	-$18,594,412
Low CapEx • -20%	Annual Profit	$396,381	-$296,701	-$1,322,991	$514,003	-$164,079	-$1,180,369
	NPV	-$20,152	-$6,961,660	-$18,931,121	$2,752,642	-$4,043,975	-$15,916,842
Breakeven	% change from modelled scenario	-20%	-135%	-228%	64%	-131%	-258%

10. Risk analysis

The following risk analysis has been undertaken to provide a broad analysis of the financial, operational, technical, legislative and social risks associated with the project. Risks have been identified through consideration of the following:

- Consultations with producers and stakeholders;
- Cost modelling for construction and operation;
- Assessment of potential sites;
- Transport and supply chain capability;
- Accessibility of infrastructure, water and power;
- Market opportunity;
- Supply volume and seasonal variability
- Skilled labour availability.

The risk analysis is based on a likelihood and consequence matrix. Details of the risk analysis framework, including defined rating levels is provided in Appendix B.

The results of the risk analysis provided in Table 30 below suggest that financial aspects of the project represent the highest risks. Specifically the following financial risks were rated “High”:

- CapEx Cost escalation (design, approvals, services, construction, equipment)
- OpEx Cost escalation – Packaging, labour, utilities etc.
- Market Price (lack of demand, market oversupply, imports)

Risks relating to legislative compliance and approvals, and environment and heritage were generally rated as “Low” or “Medium” based on available information, however this study did not include a full assessment of each site in terms of planning, environmental and heritage restrictions and conditions.

The analysis has been undertaken based on the information obtained during this study, in many cases additional analysis of specific risks would be required to better understand if/how risks can be managed.

Table 30 Risk Analysis results

Potential Risk	Likelihood	Consequences	Risk	Comment
Financial				
CapEx Cost escalation (design, approvals, services, construction, equipment)	Medium	Medium	High	Cost estimates based on best available information, however may change significantly as the project is further scoped.
OpEx Cost escalation – Packaging, labour, utilities etc.	Medium	Medium	High	Cost estimates based on best available information, however may change significantly as the project is further scoped.
Produce purchase cost escalation	Low	Low	Low	Conservative $1/kg cost assumptions based on grower consultation across major commodities. May increase or decrease depending on seasonal and market conditions.
Market Price (lack of demand, market oversupply, imports)	Medium	Medium	High	Price assumptions for processed products subject to change based on the level of demand and competition from other domestic processors and importers. It remains to be seen if the domestic market could absorb the additional products being produced from a Carnarvon plant.
Capability including access to market and transport limitations				
Lack of supply (competition from other processors)	Very Low	Medium	Low	Currently minimal competition from processors in the region.
Lack of supply (competition from fresh market)	Low	Medium	Medium	Competition likely to increase from time to time, supply of waste and seconds unlikely to be affected.
Lack of supply (natural disaster)	Low	Medium	Medium	Area prone to cyclones and floods. If occurring close to harvest these events may increase the level of waste and seconds available for processing.
Occupational Health and Safety				
Employers - death, injury or accident	Very low	High	Medium	Risk will need to be managed through appropriate OH&S measures.

Potential Risk	Likelihood	Consequences	Risk	Comment
Legislative Compliance & Approvals				
Local - Council legislation breach or MCU unable to be obtained.	Very Low	Medium	Low	Council is broadly supportive of the development.
Food Safety Stds - Food Production (Safety) Act	Low	Medium	Medium	Risk will need to be managed, particularly if processing different food groups (e.g. seafood and meat).
Environment and Heritage				
Federal - EBPC - listed community or species impacted	Very Low	Medium	Low	Search not undertaken, however assumed very low likelihood for Cornish Road (development ready) and Babbage Island (already developed) sites.
Vegetation Management / Nature Conservation Act - Vegetation Clearance not allowed	Very Low	Medium	Low	Search not undertaken, however assumed low likelihood for Cornish Road and Babbage Island sites (no/minimal vegetation removal required).
Cultural Heritage Restrictions	Low	Medium	Medium	Search not undertaken, however assumed very low likelihood for Cornish Road (development ready) and Babbage Island (already developed) sites.
Skilled Labour				
Lack of skilled workers	Low	Low	Low	Not considered a major risk by stakeholders. Ex-salt mine skilled labour available locally. Also travelling seasonal workers.
Strategic issues				
Lack of community support	Very Low	Low	Very Low	Consultation did not reveal any reason for community opposition to the development

11. Potential investment and ownership models

Some potential investment and ownership models for the facility are discussed below. Note that a number of combinations of the options below could also be considered.

11.1 Direct ownership

Existing domestic food processors

Food processing in Australia is dominated by a relatively small number of predominately foreign owned companies (e.g. Heinz, Simplot etc.). These processors have in recent times been consolidating plants within Australia, and in some cases closing facilities or moving processing off-shore (e.g. to New Zealand) to reduce costs and currency risk.

However processing in the Carnarvon region may appeal to some existing processors as a means of supplementing processing operations in the eastern states and helping to ensure supply.

Other domestic investors

Outside of existing domestic food processors, there is a range of Australian private investors or public entities who may be potential investors. Increasingly investors are seeking to increase exposure to the agricultural and food sectors particularly as mining boom subsides.

Foreign investors

Foreign investors (particularly from China) are actively seeking investments in the Australian agricultural and food sectors. Foreign investors are drawn to Australia's high quality and safety standards, which attract premium prices in foreign markets where food safety standards are not as high.

Food safety scares relating to Chinese baby formula has significantly increased the demand for foreign produced baby formula. A similar trend in fruit and vegetable based baby food could result in an attractive investment opportunity for the Carnarvon facility.

11.2 Cooperative structure

Some stakeholder interviewed were sceptical about a processing plant operating under a co-operative structure. The main concern was whether sufficient capital investment could be raised from local horticultural business. Some stakeholders were also sceptical about the governance and management arrangements for a cooperative.

In general agricultural producer cooperatives can suffer from being more supplier focussed and less customer or market focussed. This can lead to cooperatives absorbing excess supply in the market, seeking to maximise returns to producers, without sufficient market demand for the final product. Given the ownership structure, cooperatives can also have difficulty making hard economic decisions about which produce to purchase and which markets to pursue.

On the other hand, cooperatives can be effective in building supplier loyalty and ensuring equitable distribution of profits.

11.3 Joint venture of share ownership between multiple processors

A multi-food processing plant with shared services and a number of separate process lines for different types of processing could lend itself to a joint venture or share ownership structure with multiple smaller processors each with an ownership stake in the overall facility and each utilising different process lines to produce their individual products. Such an ownership structure would require careful management to avoid conflict around equipment and staff availability etc.

11.4 Processing service provision

The plant could be owned and operated by one entity which provides processing services to other parties. This fee for service structure is similar to the way existing packing facilities operate in the horticultural region.

This approach could suit smaller producers, processors and food companies in the region, who wish to market their own niche products direct to wholesalers. A similar trend is occurring in the red meat industry, where some smaller abattoirs are providing processing services to producers and meat wholesalers who wish to maintain control of their supply chain and product.

11.5 Offtake agreement

An offtake agreement is an arrangement entered into between a processor and a buyer to purchase a certain amount of the future production. It is usually negotiated well before a facility is built to ensure a market for future production and thereby increase chances of attaining finance.

These agreements are common in the mining industry where projects require considerable start-up capital and buyers are seeking to secure supply. However offtake agreements are becoming increasingly popular in the agricultural and food industries as food security has become a concern particularly for highly export reliant foreign countries (e.g. in the Middle East).

This project would most likely be suitable for an offtake agreement, particularly with a foreign investor or larger domestic processor seeking to secure supply into the future.

12. Findings

Below is a summary of the findings from this study.

12.1 The regions potential

The Gascoyne Region is well suited for establishing a food processing plant due to its

- Established and diverse food production industries
- Planned expansion of horticultural production
- Available infrastructure
- Future potential for air and sea exports, particularly to Asian neighbours.

12.2 The food processing challenge

Australian fruit and vegetable processing is a difficult operating environment, often characterised by low margins caused by a combination of factors including:

- High production costs (labour and inputs)
- Competition from imported products
- Difficulty catering to changing consumer tastes and preferences

A multi-food processing approach offers a number of benefits over conventional single process or single commodity processing, including:

- Sharing of plant and resources
- Ability to produce products incorporating multiple commodities
- Catering for seasonal produce
- Diversified income
- Ability to divert resources

However there are also some key challenges to this approach including:

- Additional cost and complexity
- Food safety

12.3 Processing options

Produce in the region is most suitable for the following broad processing options;

- Value-adding to fresh produce (convenience packs of peeled, sliced, diced products)
- Pulping and juicing
- Drying
- Extended shelf-life processing (including soup, sauce, paste, concentrate or powder).

Each of these options is outlined in more detail in Table 31 below.

Table 31 Summary of processing options

Option	Process	Product options	Packaging options
Value adding to fresh product	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Packaging, freezing, storage and dispatch	• Convenience s packs • Fruit or vegetable slices or pieces • Fruit salad	• Modified atmosphere • Vacuum packaging • Trays • Tubs • Bags
Pulping or juicing	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Heat treatment • Fine pulping • Packaging, freezing, storage and dispatch	• Raw pulp • Raw juice	• Vacuum bags • Cartons
Drying	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Sulphating • Dehydration • Packaging, freezing, storage and dispatch	• Dried or semi dried fruit or vegetable pieces	• Bags
Extended shelf-life processing	• Inbound storage and environmental control • Conveying, washing and sorting • Peeling, slicing and waste removal • Pulping • Addition of preserves, flavours and other additives • Cooking/evaporation/concentration • Packaging, freezing, storage and dispatch	• Soup • Sauce • Paste • Concentrate • Powder	• Cartons • Pouches • Tubes • Tubs • Bags • Jars

12.5 Seasonality of production

The projected seasonal variation in throughput (ranging from 10 tonnes per day in March to 52 tonnes per day in November and December) could be reduced significantly by altering the level produce purchased, i.e. purchasing more product when the plant is running below capacity and less product if the plant is running at full capacity.

Similarly plant could alter its staffing levels and/or operational times to cater for the projected throughput (e.g. close for a period of time during February and March) and add increased shifts during November and December).

12.6 Site Suitability

There are a number of sites on the outskirts of Carnarvon which would be suitable for developing a multi-food processing plant. This study identified and evaluated two greenfield sites and one existing facility. Below is a summary of the findings.

Table 32 Summary of site evaluation

Site	Pros	Cons
Site A: The Department of Agriculture land on North West Highway (new plant)	• Closest to the growing region • Good road access • Preferred by the reference group	• Currently held by the Dept. of Agriculture • Rezoning required • Potentially flood prone
Site B: Cornish Road industrial land (new plant)	• Available for immediate development • Water and electricity ready	• Non identified
Site C: Babbage Island Factory (upgrade to existing seafood plant)	• Existing factory site, avoids major greenfield development costs.	• Requires negotiation with the current owner. • Farthest site from the production region and transport links to Perth. • Currently being used for seafood processing, therefore food safety issues would need to be managed.

The Cornish Road Industrial land was identified as the most suitable greenfield site as it is immediately available, well located and serviced. A number of land parcels are available in this development and further land is likely to become available in the future.

While less suitably located in relation to production and transport links Perth, the Babbage Island factory offers considerable benefits and cost savings for an investor not wishing for a greenfield development. With excess space and capacity this site would be ideal for establishing an initial pilot plant which could be readily scaled up.

Importantly, the operators of the Babbage Island facility have expressed a strong interest in investigating options for developing the site.

12.7 Plant design

The scope of this study did not extend to plant design, however for scoping purposes a broad potential plant process design was established with a number of possible variations including:

- Base option: Value adding to fresh product, pulping and juicing
- Base option + drying process line
- Base option + drying process line + extended shelf-life processing line(s)

12.8 Financial viability

The financial analysis conducted found processing margins to be very tight and in some cases negative. Broadly the analysis found the base option (a facility producing pulp and value adding fresh product) would be the most viable option. Additional processing lines for drying and extended shelf-life processing were projected to return operating losses.

Not surprisingly upgrading the existing Babbage Island facility was found to be more viable than establishing a greenfield site, largely due to the avoided establishment costs.

Table 33 Financial viability

Item	Greenfield Site			Babbage Island Site		
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Initial CapEx	$5,148,000	$5,478,000	$8,228,000	$2,959,000	$3,289,000	$6,039,000
OpEx	$3,370,952	$4,099,559	$5,180,825	$3,119,710	$3,959,057	$5,030,323
Produce Purchase Costs	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676	$7,177,676
TOTAL ANNUAL COSTS	$10,548,628	$11,277,236	$12,358,501	$10,297,386	$11,136,734	$12,207,999
Sales revenue	$10,926,476	$11,086,554	$11,140,209	$10,926,476	$11,086,554	$11,140,209
Annual Profit	$377,849	-$190,681	-$1,218,292	$629,091	-$50,179	-$1,067,790
NPV	-$1,161,411	-$6,961,500	-$19,457,730	$3,311,239	-$3,558,536	-$15,958,171

Care should be taken when interpreting the financial analysis as the results are highly dependent on a range of cost, revenue and operational assumptions

Table 34 Breakeven analysis

Variable	Greenfield Site			Babbage Island Site		
	Base option	+ drying	+ drying + ESLP	Base option	+ drying	+ drying + ESLP
Price received	61%	65%	73%	59%	63%	71%
Cost of produce inputs	$0.98	$0.88	$0.70	$1.03	$0.93	$0.75
OpEx	96%	80%	60%	107%	88%	65%
CapEx	80%	-35%	-128%	164%	-31%	-158%

12.9 Investment and ownership models

The facility could be developed using a range of investment or ownership models including direct ownership (by an existing food processor, foreign investor or other domestic investors) or a cooperative structure.

The facility may also be suitable for other more alternative models including:

- Joint venture of share ownership between multiple processors
- Processing service provision

Establishing an offtake agreement with a domestic of foreign buyer may help to secure finance for the plant's establishment.

12.10 Recommendations

Consider establishing a pilot plant on the Babbage Island facility

This study has found the development of the Babbage Island facility represents the most viable option for establishing a food processing presence in the region. This existing facility offers an excellent opportunity to establish a pilot fruit and vegetable processing plant which would assist the operator refine their processes, products, target markets and branding.

If successful the operation could easily be scaled up within the existing Baggage Island site, or through the establishment of a new greenfield plant in the region. With an established process, product, market and brand, attracting capital investment for such an expansion is likely to be considerably easier.

Pursue niche domestic market opportunities

This study has highlighted the need for a facility to produce products which are differentiated from imported products on the grounds of food safety, convenience and quality. This may involve pursuing:

- Higher end domestic markets e.g. food service
- Potential export markets where food safety will attract substantial premiums (e.g. baby food to China)

13. References

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Appendix A – Regulations affecting the processing of multiple food types

As part of this feasibility study GHD were asked to investigate any food safety regulatory issues for processing multiple food groups (e.g. fruit and vegetables, seafood and red meat) using shared facilities and equipment.

All food processing facilities in Australia and New Zealand must adhere to relevant food legislation. The three most relevant pieces of legislation are the Food Act 2008 (Western Australia), Food Regulations 2009 and the Food Standards Code. The food standards code contains general standards for all processing facilities and specific product standards. The most applicable standards are listed below (Pers Com. Tracey Stamp – Scientific Officer – Environmental Health Directorate).

Food Standards Code	Products	Description
3.2.2	All	This code specifies process control requirements to be satisfied at each step of the food handling process. Some requirements relate to the receipt, storage, processing, display, packaging, distribution disposal and recall of food.
3.2.3	All	This standard (Food Premises and Equipment) sets out requirements for food premises and equipment that, if complied with, will facilitate compliance by food businesses with the food safety requirements of Standard 3.2.2 – Food Safety Practices and General Requirements.

The main objective of Standard 3.2.3 is to ensure that, where possible, the layout of the premises minimises opportunities for food contamination. This would be the main issue for such a multi-purpose facility that would have to be carefully considered to ensure the risk of contamination at each process stage is minimised.

In addition to above there are separate Food Standards Codes that apply to specific product types, which would need to be adhered to.

Food Standards Code	Product
2.3.1	Fruits and vegetable
2.2.1	Meat and meat products
2.2.3	Fish and fish products

Other useful links are provided below

Description	Link
The Food Act	http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_3595_homepage.html
Australia New Zealand Food Standards Code	http://www.foodstandards.gov.au/Pages/default.aspx

Appendix B – Risk Analysis Framework

13.1 Risk Parameters

Risk parameters have been based on the key components of the feasibility assessment including site constraints, economic factors, and transportation limitations. The seven (7) risk dimensions considered are described in Table 25 below.

Table 35 Description of Risk Parameter

Risk Dimension	Description
Financial	An assessment of the potential for cost impacts to construction or operation that could be incurred. This includes costs directly related to the project itself and any flow on costs. This would also cover return on investment.
Capability including supply and transportation restrictions	Capacity of the facility to operate based on supply, transportation restriction or other capacity restricts.
Occupational Health and Safety (staff and public)	Impact on the physical well-being of employees, contractors, communities in the Gascoyne region and the public in general.
Legislative Compliance & Approvals	Compliance with regulatory requirements and the impact of failing to obtain approvals or comply. Including but not limited to Federal, State, Local legislation.
Environment and Heritage	Impact on the Environment, defined by Environmental legislation including: a. Ecosystems and their constituent parts including people and communities. b. Natural and physical resources. c. Qualities and characteristics of locations, places and areas. d. Heritage values of places. e. The social, economic and cultural aspects of a thing mentioned in paragraphs (a), (b), (c) or (d). Sites could have Historic, Indigenous and Natural heritage values.
Skilled Labour	Impact on ability to construct and operate facility, in the context of staff recruitment, staff retention and productivity.
Strategic Issues	Impact on strategy in developing or managing the meat processing facility, political, community concerns or actions over activities. Impact on compliance with Government commitments as opposed to specific government policy/legislation.

13.2 Likelihood Guidance

The likelihood descriptors detailed below in Table 36 were used to determine the likelihood of a consequence occurring at any time in the future.

Table 36 Likelihood Descriptors

Rating	Description
High	High probability of the consequences occurring. Has happened several times in the past five years OR has a > 60% chance of occurring if the risk is not mitigated.
Medium	Even (50%) probability of consequences occurring. Has happened during the past five years but not in every year OR has a 40-60% chance of occurring if the risk is not mitigated.
Low	Low probability of occurrence but not negligible. May have occurred once in the last 5 years, or has a 10-30% chance of occurring in the future if the risk is not mitigated.
Very Low	Very low probability of the consequences occurrence but not impossible. Has not occurred in the past five years OR may occur in exceptional circumstances, i.e. less than 10% chance of occurring if the risk is not mitigated.

13.3 Consequence Guidance

The consequence descriptors that follow, in Table 37, are based on consequences that could occur if issues are not managed or based on the consequences of following management actions. This includes consideration of the possible direct and follow on consequences in the short and long term.

Table 37 Consequence Descriptors

	High	*Medium*	*Low*	*Very Low*
Financial	> 100% increase in project development or operating cost.	50-100% increase in project development or operating cost, i.e. more than double the cost.	10-50% increase in the project development or operating cost.	Less than 10% increase in project development or operating cost in the following year.
Capability including access to market and transport limitations	All activities cease and unable to conduct business. All activities cease and major unacceptable delays in delivery of product. Full production not possible within 28 days.	Some activities curtailed however in a significantly degraded production rate. Full production not possible within 7 days.	Some activities curtailed however one or more of the significant requirements of the production would not be met. Full production not possible within 24 hours.	Minimal activities curtailed. Minor delays or minor production degradation.
Occupational Health and Safety	One or more fatalities or life threatening injuries or illness (including permanent disability). Public or staff exposed to a severe, adverse long-term health impact or life-threatening hazard (including permanent disability).	One or more injuries or illness requiring treatment by a physician or hospitalisation. Public or staff exposed to a hazard that could cause injuries or moderate adverse health effects.	One or more injuries or illness requiring treatment by a qualified first aid person. Exposure of public and staff to a hazard that could cause minor injuries or minor adverse health effects.	Minor injury or ailment that does NOT require medical treatment by a physician or a qualified first aid person.
Legislative Compliance & Approvals	Potential exposure to significant damages involving one or more persons. Prosecution with maximum penalty imposed. Failure to obtain approvals – MCU, ERA, Water Act and etc	Potential exposure to large damages or awards. Some legal constraints imposed with up to half of maximum fine imposed.	Minor technical legal challenge or legal breach Minor damages or monetary penalty. Non-compliance with Department Policy	Minor technical breach but no damages. No monetary penalty.

	High	*Medium*	*Low*	*Very Low*
Environment and Heritage	Adverse impact on the site's heritage values, or a heritage asset on the site that is likely to either: • Permanently destroy the heritage values or • Require an emergency commitment of substantial resources (time and /or money) to remediate, or would take more than 10 years to recover through natural processes • Substantially alter in a way that is inconsistent with the heritage values, any one of the following: – *Physical nature of a site or asset* – *Setting of the site or asset* – *Value of the site or asset for a community or group for which it is significant* – *Use of a site as a cultural or ceremonial site.* Significant negative impact on Environmental components identified for the site, especially those components relating to state and federal environmental legislation that is likely to: • have an impact that meets any two of the following criteria: 1. Permanent or irreversible. 2. Medium - large scale. 3. Moderate - high intensity.	Impact on the site's with heritage values, or a heritage asset on the site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require a programmed commitment of substantial resources (time and /or money) to remediate, or will take >2 years for the viability of ecosystems, or their constituent parts to recover. 2. Medium scale and contained on-site. 3. Moderate intensity.	Impact on the site's heritage values, or a heritage asset on the site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require a programmed commitment of resources (time and/or money) to remediate, or will take less than 2 years for the viability of the ecosystems, or their constituent parts to recover. 2. Small scale 3. Low intensity.	Impact on the site's heritage values, or a heritage asset on the site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require minor repair that will be rectified during routine maintenance, or will take less than one month for the viability of the ecosystems, or their constituent parts to recover. 2. Small scale on site and localised. 3. Very Low intensity.

	High	*Medium*	*Low*	*Very Low*
Skilled Labour	Serious negative affect on staff recruitment or retention, resulting in no production capacity. Industrial action is about to be taken. Skilled labour unavailable.	Major negative affect on staff recruitment or retention, affecting major loss of productivity, > 5 days lost. Threat of Industrial Action.	Moderate negative affect on staff recruitment or retention, affecting some loss of productivity, < 5 days lost. Employee representative involvement.	Limited impact on staff recruitment or retention in any area.
Strategic issues	Detrimental political or social impacts. Subject of negative regulator attention. Non-realisation of a Council support & commitment.	Moderate political and social impacts. Subject of a number of parliamentary and ministerial questions. Sustained community outrage.	Limited political or social impacts. Subject of a parliamentary question or ministerial. Organised community concerns and complaints.	Subject of local government action. Random complaints from the community. Low profile detrimental local media reports.

13.4 Risk Level

The Risk Assessment Matrix in Table 38 was used to assign a Risk Level (Insignificant to Extreme) to a given risk.

The Risk Level for each risk dimension is determined by combining the consequence and likelihood rating values. The Risk Level represents the overall level of a risk. This framework follows a precautionary approach, in that if the parameter is assessed as a Low Risk, but one dimension is assessed as a High Risk, the overall Risk Level for that risk is considered to be High.

Table 38 Risk Assessment Matrix

LIKELIHOOD RATING	Consequence Rating			
	High	**Medium**	**Low**	**Very Low**
High	Extreme	Very High	High	Medium
Medium	Very High	High	Medium	Low
Low	High	Medium	Low	Very Low
Very Low	Medium	Low	Very Low	Insignificant

Appendix C – Stakeholder Consultation

The following stakeholders were consulted during this project either in person, via telephone or email.

Table 39 Stakeholders consulted

Name	Organisation
Reference Committee	
Paul Hannah	Gascoyne Development Commission
Joyce Babun	Loveapple
Paul Shain	Gascoyne Food Council
Simon Moore	Carnarvon Chamber of Commerce and Industry
Tom Day	Plantation Owner
Doriana Mangili	Sweeter Banana
Valerie Shrub	DAFWA
Luke Skender	Carnarvon Growers Association
Additional Stakeholder Consulted	
Troy Sinclair/Simon Rogers	Department of Water
Peter Jecks	Abacus Fisheries
Jo Bumbak	Bumbaks Preserves
Rob Paull	Shire of Carnarvon
Ivan Durmanich	Gascoyne Gold
Mark Durmanich	Gascoyne Gold
Tony Della Bosca	DAFWA (Gascoyne Foodbowl Initiative)
Brett Hogan	Focus Fisheries
Duc Nguyen	Tomato Grower
Robbie Kuzmicich	Capsicum Grower
Dave Elderton	Tropico
Alex Austin	Key Technology
Rob De Reus	GEA International
Bob Vinson	Department of Agriculture and Food WA
Graham Meinema	Department of Fisheries WA
Colin Dorber	Lockyer Valley Beetroot Company
Bourke Maslen	Outback Coast Property
Trina Anderson	DAFWA

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