Kangaroo Island Sea Access
Economic Assessment Study

A report prepared for

Kangaroo Island Development Board Inc.

Prepared by

EconSearch Pty Ltd

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Abbreviations

BDMT	Bone dry metric tonne
fte	Full time equivalent
GMT	Green metric tonne
GRIT	Generation of Regional Input-output Tables
KI	Kangaroo Island
KIDB	Kangaroo Island Development Board Inc.
TOMM	Tourism Optimisation Management Model

Acknowledgements

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Executive Summary

Study Aim

Kangaroo Island (KI) is highly dependent on intermodal land-sea transport services for the import of goods from the mainland and the export of products from the island. KI's access to a range of competitively priced transport options is constrained, however, by its geographical isolation from the mainland.

Concerns exist that the cost of freight and passenger transport to and from Kangaroo Island is excessive and, consequently, inhibits economic development of the island's industries, particularly tourism and primary production.

The aim of this project was to test the veracity of the argument that the cost of passenger and freight transport between the mainland and KI is a key determinant of business viability and overall economic development on the island.

To this end, a range of future scenarios for economic growth and development on the island were prepared and presented assuming freight and passenger transport costs were reduced by 10, 25, 50, 75 and 100 per cent[1].

Kangaroo Island Economy

Some key characteristics of the KI economy estimated for the baseline year of 2001/02:

- Gross regional product: $135 million
- Total jobs: 2,356 (1,881 full time equivalents)
- Regional exports: $114 million; imports; $71 million; positive trade balance: $43 million
- Household income: $60 million
- Value of agricultural industries: $69 million
- Value of tourist expenditure (on island): $53 million

Key Transport Issues

A number of key transport-related issues were identified.

- *Freight cost* - transport between KI and mainland markets (Adelaide) is considered to be relatively expensive as a result of the land distance, the sea crossing costs and the relatively low population/economic base on KI.

[1] The reduction in freight and passenger transport costs could be achieved through direct subsidy, an increase in competition in the provision of transport services or some reconfiguration of existing transport arrangements. However, consideration of these issues was outside the brief of this study. It was assumed throughout the study that any reduction in sea transport costs would apply equally to all services regardless of the number of sea transport operators.

- *Under-utilisation of capacity* - average utilisation of available capacity is generally low at approximately 30 per cent for passengers, 40 per cent for freight and 50 per cent for vehicles, however, during peak times there is little or no spare capacity.
- *Transport inefficiencies* - because a higher volume of freight is exported from the island than is imported, a lack of back loads lead to transport inefficiencies that translate into higher transport costs. Further transport inefficiencies result from down time associated with ferry travel (i.e. marshalling, loading, travel time), short travelling distances, over-capitalisation and aging equipment.
- *Lack of competition* - over the years, several proposals have been submitted to the South Australian Government from parties wishing to operate competing ferry services between the mainland and KI. Independent modelling has indicated that the introduction of a direct competitor to SeaLink on the Cape Jervis to Penneshaw route could result in commercial failure of one of the services.

Freight Cost Comparison with Mainland Operators

Kangaroo Island's livestock, bulk haulage and general carrier freight costs are higher than mainland costs. The following findings highlight the differential.

- The total cost of transporting a truckload of sheep (400 head) from KI to Adelaide (approximately 170km) is $2,000 or $5.00 per head.
- Over a similar distance on the mainland, the cost per head would be approximately $1.55 per head.
- The approximate cost of trucking a load of grain (with a superphosphate backload) 170km from KI to Port Adelaide is $30 per tonne. A Murray Bridge-based carrier charges $11 per tonne to deliver from the Murray Bridge region to Port Adelaide (90kms).
- For a charge of $30 per tonne, a mainland carrier would travel a distance of approximately 550km (assuming a charge of $1.40 per km for a trailer carrying 26 tonnes).

Impact of sea freight costs on primary industries

Total gross revenue for primary production (agriculture plus fishing) on KI was estimated to be approximately $76 million in 2001/02. Sea freight expenditure was estimated to represent, on average, 3.3 per cent of total gross revenue. In total, sea freight expenditure by KI's primary industries was estimated to be $2.5 million (Table ES1).

KI's total freight expenditure (sea and road) of $5.4 million represents 7.0 per cent of gross primary industry revenue. This is substantially higher than that estimated for primary industries in Australia as a whole, being 3.4 per cent (ABS 2001).

Table ES1 Aggregate freight expenditures for primary industries: Kangaroo Island (2001/02)

Enterprise	Sea Freight as a % of gross revenue	Road Freight as a % of gross revenue	Freight as a % of Gross Revenue	Industry Gross Revenue ($)	Sea Freight Expenditure ($)	Road Freight Expenditure ($)	Total Freight Expenditure ($)
Wool & sheep [a]	1.8%	3.3%	5.1%	24,637,254	451,307	802,778	1,254,085
Sheep & wool [b]	2.8%	5.9%	8.7%	19,730,160	558,356	1,160,974	1,719,330
Beef cattle	3.1%	5.6%	8.7%	7,624,172	239,574	426,302	665,876
Other livestock	2.6%	4.9%	7.5%	448,813	11,675	22,043	33,718
Cereals	11.9%	4.2%	16.1%	5,500,021	655,859	229,756	885,615
Other crops	3.0%	1.0%	4.0%	6,357,994	189,542	66,399	255,942
Oil seeds	8.8%	3.1%	11.9%	4,437,375	389,836	137,428	527,265
Rock lobster [c]	0.0%	0.0%	0.0%	4,934,348	0	0	0
Abalone, marine scalefish	0.8%	1.9%	0.8%	2,670,808	20,536	50,686	20,536
Total	**3.3%**	**3.8%**	**7.0%**	**76,340,946**	**2,516,685**	**2,896,367**	**5,362,366**

[a] Freight percentages based on a typical wool producing enterprise with approximately two-thirds of income from wool and one-third from the sale of sheep.

[b] Freight percentages based on a typical prime lamb enterprise with approximately 70 per cent of income from the sale of sheep and 30 per cent from wool.

[c] Rock lobster fishers receive the same price per kilogram landed as mainland fishers (e.g. Victor Harbor). It is assumed that rock lobster buyers absorb KI-related freight costs.

Estimated economic impact of reductions in sea freight costs

The impact of reduced sea freight costs (10, 25, 50 75 and 100 per cent reduction) on KI primary industries' profitability is summarised in Table ES2. Clearly, a sea-freight reduction is likely to have a greater impact on net returns for KI's cropping industries than on net returns for the livestock and fishing industries.

Table ES2 Impact of sea freight cost reduction on Primary Industries' profitability: Kangaroo Island [a]

Primary industry measure of profitability [b]	Net Returns for Varying Levels of Sea Freight Cost Reduction						Increase in net returns with 100% reduction
	0%	10%	25%	50%	75%	100%	
Wool Gross Margin [c] ($/ha)	301	302	303	306	308	311	3%
Prime Lambs Gross Margin ($/ha)	218	220	222	227	231	235	8%
Beef Cattle Gross Margin ($/ha)	95	95	96	98	100	102	7%
Wheat Gross Margin ($/ha)	260	271	287	313	340	367	41%
Canola Gross Margin ($/ha)	321	327	336	351	366	380	19%
Oats Gross Margin ($/ha)	279	282	286	294	301	309	11%
Marine Scalefish Cash OS [d] ($'000)	30.2	30.2	30.3	30.4	30.5	30.6	1%
Rock Lobster Cash OS ($'000)	88.8	88.8	88.8	88.8	88.8	88.8	0%

[a] These results were derived on the basis of estimated costs and returns at the time of compiling the report. Changes in input costs and product prices could substantially alter the estimated impact of sea freight cost reductions.

[b] Details of industry profitability can be found in Section 3 and Appendix 2.

[c] Gross margin is the difference between gross income and variable costs of an enterprise.

[d] Cash operating surplus is the difference between gross income and total cash costs.

Estimated Economic Impact of Increased Visitor Numbers

Based on predicted changes in the number of visitors in response to a change in sea transport costs, it was estimated that visitor expenditures associated with tourism to Kangaroo Island would increase by $2.3 million from a 10 per cent sea transport cost reduction and up to $21.2 million from a 100 per cent reduction (Table ES3).

Table ES3 Change in visitor expenditure for varying levels of passenger sea transport cost reduction – KI ($m)

	Sea transport cost reduction					
Visitor Group	0%	10%	25%	50%	75%	100%
International	-	0.7	1.7	3.3	4.8	6.2
Interstate	-	0.4	1.1	2.2	3.2	4.1
Intrastate	-	1.2	2.9	5.6	8.3	10.8
Total	-	2.3	5.7	11.1	16.3	21.2

In addition to the expenditure on KI, visitor expenditures associated with tourism to Kangaroo Island will also involve expenditure on goods and services elsewhere in South Australia. The change in visitor expenditure for varying levels of passenger sea transport cost reduction in the state as a whole increase by $2.7 million from a 10 per cent sea transport cost reduction up to $23.5 million from a 100 per cent reduction.

Economic Impacts of Reduced Sea Transport Costs

Sea freight cost reductions will increase net returns of individual primary production enterprises (leading to increases in disposable income) and lead to increases in visitor numbers and visitor expenditure.

The tourism impacts are much larger than the primary industries related effects. For example, a 10 per cent reduction in sea transport costs will generate, in total, an additional $2.8 million in value added (gross regional product), of which $2.7 million would be generated by increased tourist expenditures and the balance from additional household expenditure by primary producers (Table ES4).

For high rates of transport cost reduction, the impacts on the Kangaroo Island economy become significant. The total impact (tourism and primary industries related) of a 100 per cent reduction, for example, would add 19 per cent to gross regional product ($25.8 million), 16 per cent to household income on the Island ($9.7 million) and 18 per cent to employment (346 jobs). An employment increase of this magnitude could increase KI's population by more than 800[2].

[2] This assumes that all new employment would be sourced from off the island (not unreasonable given that the current unemployment rate is around 3.6 per cent) and that population would increase in line with the current population/ fte employment ratio of around 2.3.

Table ES4 Total economic impact of sea transport cost reduction - KI

	Sea transport cost reduction					
	0%	10%	25%	50%	75%	100%
Value Added ($m)						
Primary Industries related impact	-	0.1	0.3	0.5	0.8	1.1
Tourism related impact	-	2.7	6.7	13.1	19.1	24.8
Total impact	*-*	*2.8*	*7.0*	*13.6*	*19.9*	*25.8*
Household Income ($m)						
Primary Industries related impact	-	0.0	0.1	0.2	0.3	0.4
Tourism related impact	-	1.0	2.5	4.8	7.1	9.3
Total impact	*-*	*1.0*	*2.6*	*5.0*	*7.4*	*9.7*
Employment (no. of jobs)						
Primary Industries related impact	-	1	3	6	9	12
Tourism related impact	-	35	87	171	253	333
Total impact	*-*	*36*	*90*	*177*	*262*	*346*

Increased spending by households involved in primary production and increased visitor expenditure in tourism will generate additional economic activity and flow-ons in the state economy. These impacts are estimated to be slightly larger than the impacts on Kangaroo Island as a proportion of the increased spending will occur off island, elsewhere in South Australia.

A 100 per cent reduction in sea freight and passenger transport costs would, in total, add $26 million to State's economy and generate over 400 jobs. These positive impacts need to be considered in light of the costs that would be involved in providing the reduced or zero cost sea transport service.

Conclusions

- The impact of freight costs, and sea freight costs in particular, on primary industries' profitability is quite variable. Freight costs are significant for grain producers, but less important for the higher value, lower volume industries such as wool and fishing.
- The importance of freight rates will vary with yields, prices and other costs. In times when margins are relatively low (due to low prices, yields or both), freight costs will become far more significant as a determinant of business profit.
- The tourism impacts of reduced sea transport costs would be much larger than the primary industries related effects.
- For high rates of transport cost reduction, the impacts on the Kangaroo Island economy would become significant.
- A significant reduction in sea freight and passenger transport costs could generate other impacts that have not been quantified in this study, such as increased investment, growth in the number of retirees residing on the island and increased opportunities to bring processed food and wine products back to the island for sale

to residents and visitors. If these unquantified benefits were real and substantial, then the estimated impact of sea freight cost reductions could be significantly understated.

- For the purposes of this study, there was no explicit assumption about how the level of freight cost reduction (i.e. 10, 25, 50, 75 and 100 per cent) would be achieved. If it were brought about by a direct freight/transport subsidy, state government or both state and federal governments would most likely pay it. For this reason, any impacts that might be felt on Kangaroo Island as a result of a sea freight subsidy are likely to be offset at the state and national levels by reduced government expenditures in other areas.
- If some of the reduction in freight costs were bought about by improvements in efficiency (rather than subsidy), then positive economic impacts would be felt more widely at the state and national levels.
- Reductions in sea freight and passenger transport charges are likely to be achieved over the long-term by one or more of the following:
  - sustained government commitment (e.g. investment in improved infrastructure, fare/freight subsidies);
  - increased competition among service providers; and
  - reduced sea transport operating costs.
- To realise KI's economic development potential, KIDB should have as a key priority the ongoing pursuit of measures that will bring about long-term, sustainable reductions in sea freight and passenger transport charges, particularly the latter.

1. Introduction

1.1 Background

Economic development in a region is heavily dependent on access to reliable and cost effective transport options. Structural changes and improvements in productivity will have little impact on a regional economy if producers cannot efficiently transport product to market.

Business SA emphasise the importance of transport in their *Manifesto*, where it is claimed that the effectiveness and efficiency of the transport system is fundamental to influencing economic development, job growth and international competitiveness.

An efficient transport system should:

- not add significantly to costs of production;
- offer appropriate levels of service (i.e. frequency, time and quality); and
- be effectively integrated to up-links in the transport chain.

Kangaroo Island (KI) is highly dependent on intermodal land-sea transport services for the import of goods from the mainland and the export of products from the island. KI's access to a range of competitively priced transport options is constrained, however, by its geographical isolation from the mainland.

Concerns exist that the cost of freight and passenger transport to and from Kangaroo Island is excessive and, consequently, inhibits economic development of the island's industries, particularly tourism and primary production.

The Kangaroo Island Development Board (KIDB) has identified a need to test the veracity of the argument that the cost of passenger and freight transport between the mainland and KI is a key determinant of business viability and overall economic development on the island.

KIDB, with funding assistance from the Office of Employment and Office of Regional Affairs commissioned this study to assess the economic benefits to the Kangaroo Island and South Australian economies of reduced freight and passenger transport costs to and from the island.

This study was undertaken by Amanda Hamilton and Julian Morison (EconSearch Pty Ltd) and Barry Burgan (Economic Research Consultants Pty Ltd).

1.2 Project Objectives

The key project objectives were to:

1. Undertake analysis of the existing viability and future expansion of Kangaroo Island businesses and industry sectors inclusive of the island's contribution to the state and national economies; and

2. Prepare and present a range of future scenarios for economic growth and development on the Island assuming freight and passenger and transport costs were reduced by 10, 25, 50, 75 and 100 per cent[3].

1.3 Approach

The following approach was employed in meeting the key objectives of the consultancy.

Inception Meeting

The project commenced with an inception meeting between the consultants and representatives of KIDB to confirm and clarify the approach, content and timing of the analysis and to obtain relevant reference material.

Review of Existing Literature

A range of existing literature regarding KI's transport-related issues was reviewed to inform the analysis. Existing reports and data were also consulted to gather background information on the KI economy and key industries.

Liase with Key Stakeholders

Interviews were conducted with key industry stakeholders from KI's agriculture, fishing, forestry and tourism industries to provide qualitative support to the development of industry scenarios. KIDB representatives and transport operators (KI and mainland) were also consulted during the course of the study.

Economic Analysis

The following steps were undertaken in conducting the economic analysis for this study.

- Assessed the current financial viability and growth potential of key industries on KI.
- Assessed the importance of transport and transport costs in the financial outcomes of key industries.
- Projected outcomes for the various industries based on alternative transport cost outcomes.
- Assessed the economic benefits of alternative transport cost outcomes from an island, state and national perspective.

[3] The reduction in freight and passenger transport costs could be achieved through direct subsidy, an increase in competition in the provision of transport services or some reconfiguration of existing transport arrangements. However, consideration of these issues was outside the brief of this study. It was assumed throughout the study that any reduction in sea transport costs would apply equally to all services regardless of the number of sea transport operators.

Presentation to KIDB

Preliminary results were presented to members of KIDB and discussions held to obtain comments and feedback.

Report

Following discussion with members of KIDB and consideration of comments and feedback, the final report was prepared summarising the outcomes of the analysis.

1.4 Report Outline

The report is structured as follows

- Section 2 provides an overview of the KI economy and discusses current conditions and the future outlook for KI's agriculture, fishing, forestry and tourism industries.
- In Section 3, an overview is provided of transport issues on KI. Representative models, developed to assess enterprise viability and the significance of transport costs, are summarised and discussed. A freight cost comparison is also made between KI and the mainland.
- In Section 4, the impact on key KI industries of reduced sea transport costs is assessed.
- Section 5 provides an assessment of the economic impacts of reduced sea transport costs from an island and state perspective.

2. Kangaroo Island Economy

2.1 Overview

The economy of the region is largely based on agriculture, tourism and fishing. These key economic drivers are supported by a range of service industries, particularly in the services to agriculture, accommodation and business services sectors. The four main towns of Kingscote, Penneshaw, American River and Parndana provide retail, commercial and community services for a population of around 4,400.

Kangaroo Island's economic base is expanding with the potential for increased tourism being recognised and with new industries being targeted, including aquaculture, sustainable development (e.g. wind farms) and forestry.

Although tourism is an established industry, there is evidence that it is underdeveloped given the natural attributes of the Island. Kangaroo Island has become a premier eco-tourism destination with 21 national parks and conservation reserves covering more than 30 per cent of the Island. Despite this the industry is typified by underdeveloped raw product and small tourism enterprises which struggle to develop sufficient market exposure to ensure commercial sustainability.

Regional population has grown slowly since the 1970s and continues to grow, but at a rate of less than 1 per cent per year. The unemployment rate in 2000 was around 9.3 per cent, well above the State average. More recent data (June 2003) suggests the Kangaroo Island unemployment rate is 3.6 per cent, well below the current state level of 6.2 per cent (DEWR 2003).

There are a number of characteristics of the region that distinguish it from other regions in the state.

- Kangaroo Island has a significantly smaller population than other regions in South Australia.
- There is very little manufacturing in the region.
- The isolation and low population create size and scale issues for all businesses.
- The relatively high project development costs and ongoing operational costs are due, in part, to high access costs to the island.

2.2 Key Characteristics of the Kangaroo Island Economy

For the purpose of this study, EconSearch developed a regional input-output model of the Kangaroo Island economy. The development of the model involved the construction of a substantial database in which a range of production, value of production, wages and salaries and household expenditure data were collected for the large number of sectors that comprise the Kangaroo Island economy. The input-output model was constructed for 2001/02 using the Generation of Regional Input-Output Tables (GRIT) technique (Appendix 1).

The input-output table provides a numerical picture of the size and shape of the economy and its essential features. The input-output transactions table can be used to describe some of the important features of an economy, the interrelationships between sectors, and the relative importance of the individual sectors. Employment, wages and salaries, turnover and value added can all be estimated on an industry-by-industry basis[4]. As well, the regional trade balance and gross regional product can be estimated from the model.[5]

Estimated regional trade balance and gross regional product are provided in Table 2.1 for both Kangaroo Island and South Australia. Gross regional expenditure (household expenditure plus other final demand) plus the regional trade balance (exports minus imports) gives gross regional product, estimated to be approximately $135 million in 2001/02. This compares with gross state product for South Australia of $47.0 billion for the same period.

Table 2.1 Gross regional product for Kangaroo Island and South Australia, 2001/02 ($m)

	Kangaroo Island [a]	South Australia [b]
Household Expenditure	60	20,694
Other Final Demand [c]	32	28,319
Gross Regional Expenditure	92	49,013
Plus Exports [d]	114	17,767
Less Imports [e]	71	19,778
Gross Regional Product	135	47,002

[a] Derived from Kangaroo Island Input-Output Table, 2001/02.
[b] Derived from ABS (2003) and EconSearch (2001).
[c] Includes government recurrent expenditure and private and public sector capital formation.
[d] Refers to exports from KI to elsewhere in SA, interstate and overseas.
[e] Refers to imports to KI from elsewhere in SA, interstate and overseas.

Tables 2.2 to 2.4 and the associated Figures 2.1 to 2.3 are drawn from an input-output transactions tables developed for the Kangaroo Island economy for 2001/02. While Table 2.2 provides some additional summary indicators for the Kangaroo Island economy, the subsequent tables and figures show the relative importance of each sector of the KI economy in terms of output, value added and employment.

[4] These terms are defined in Appendix 2.

[5] Input-output analysis also provides a standard approach for the estimation of the economic impact of a particular activity. The input-output model is used to calculate industry multipliers and these are used later in the report to estimate the impact of various transport cost reduction scenarios.

Table 2.2 Other key indicators for Kangaroo Island, 2001/02 [a]

	Kangaroo Island
Gross Output ($m)	224
Household Income ($m)	60
Total Employment (no. jobs)	2,356
Total Employment (fte)	1,881

[a] Derived from Kangaroo Island Input-Output Table, 2001/02.

Table 2.3 Kangaroo Island employment and output by sector, 2001/02

	Total Employment [a]		Full-Time Equivalent Employment [b]		Output [c]	
	(no.)	(%)	(fte)	(%)	($'000)	(%)
Sheep	310	13.2%	277	14.7%	44,367	19.8%
Grains	57	2.4%	49	2.6%	10,859	4.8%
Other Livestock[d]	105	4.5%	94	5.0%	7,967	3.6%
Other Agriculture[e]	45	1.9%	40	2.1%	6,772	3.0%
Forestry	23	1.0%	19	1.0%	1,035	0.5%
Fishing	86	3.6%	63	3.3%	7,605	3.4%
Manufacturing	82	3.5%	62	3.3%	19,281	8.6%
Utilities	5	0.2%	5	0.3%	2,113	0.9%
Construction	123	5.2%	102	5.4%	7,817	3.5%
Trade	369	15.7%	289	15.4%	20,068	9.0%
Accmommodation, Restaurants and Cafes	254	10.8%	183	9.7%	16,131	7.2%
Transport and Storage	204	8.6%	153	8.1%	22,781	10.2%
Communication Services	24	1.0%	21	1.1%	2,780	1.2%
Finance and Insurance	29	1.2%	22	1.2%	2,932	1.3%
Ownership of Dwellings	0	0.0%	0	0.0%	10,630	4.7%
Business Services	112	4.7%	84	4.5%	15,023	6.7%
Public Administration	101	4.3%	85	4.5%	7,785	3.5%
Education	157	6.7%	120	6.4%	6,592	2.9%
Health	156	6.6%	118	6.3%	6,302	2.8%
Recreational Services	63	2.7%	54	2.9%	3,131	1.4%
Personal Services	53	2.2%	41	2.2%	2,016	0.9%
TOTAL	2,356	100.0%	1,881	100.0%	223,988	100.0%

[a] Number of part-time and full-time working proprietors, managers, directors and other employees.
[b] The number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalent job.
[c] Gross revenue of goods and services produced by commercial organisations, plus gross expenditure by government agencies.
[d] Beef, dairy, eggs, honey.
[e] Hay, grapes, vegetables, orchard fruit, pasture, services to agriculture.

Source: EconSearch analysis.

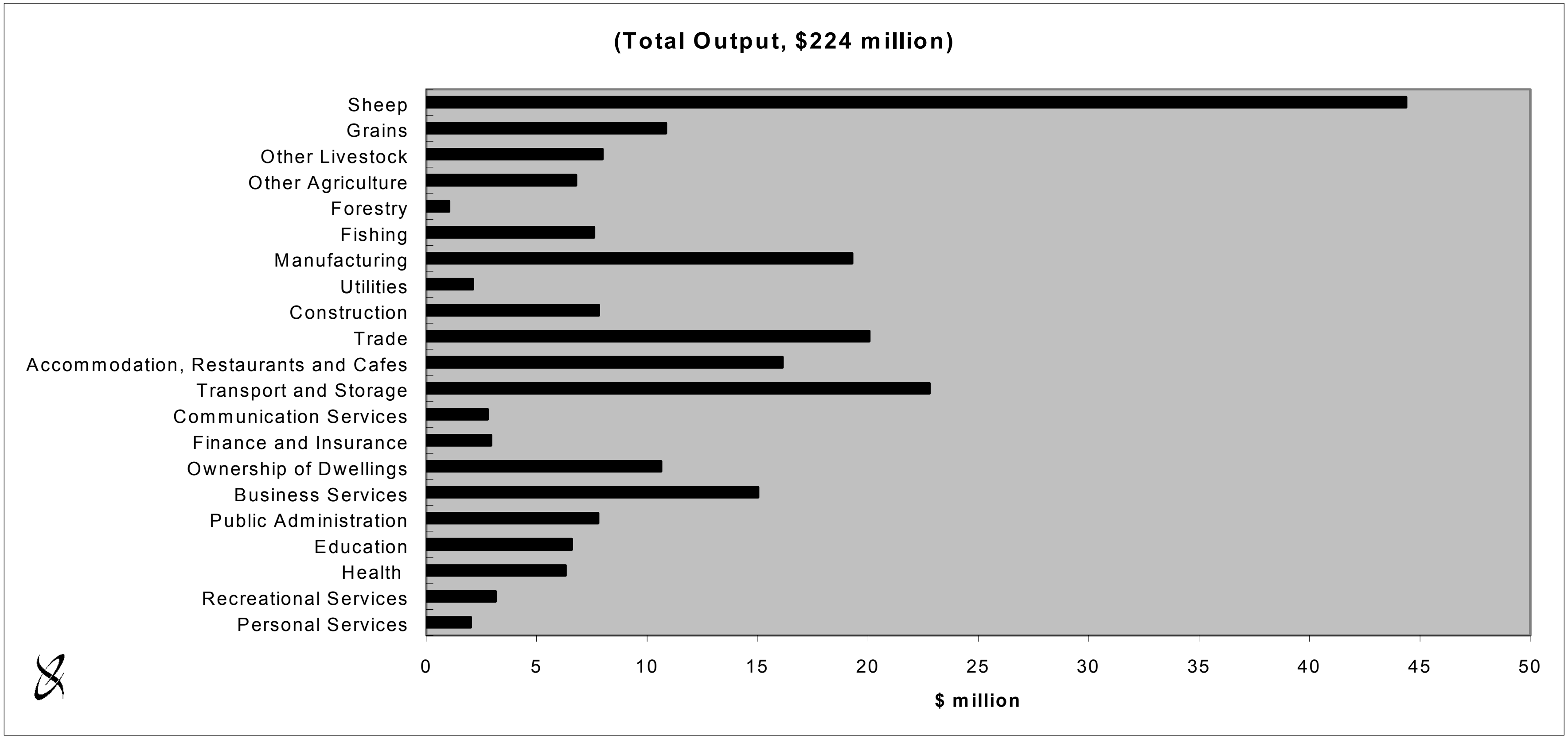
Table 2.4 Kangaroo Island household income and other value added by sector, 2001/02

	Household Income [a]		Other Value Added [b]		Total Value Added [c]	
	($'000)	(%)	($'000)	(%)	($'000)	(%)
Sheep	7,161	11.9%	21,234	30.4%	28,395	21.9%
Grains	1,498	2.5%	5,697	8.2%	7,195	5.5%
Other Livestock [d]	2,066	3.4%	3,390	4.9%	5,456	4.2%
Other Agriculture [e]	1,827	3.0%	2,358	3.4%	4,185	3.2%
Forestry	452	0.8%	149	0.2%	601	0.5%
Fishing	2,755	4.6%	1,972	2.8%	4,726	3.6%
Manufacturing	2,382	4.0%	2,527	3.6%	4,910	3.8%
Utilities	301	0.5%	889	1.3%	1,190	0.9%
Construction	2,234	3.7%	2,193	3.1%	4,426	3.4%
Trade	7,298	12.1%	3,713	5.3%	11,012	8.5%
Accommodation, Restaurants and Cafes	4,236	7.0%	3,036	4.3%	7,272	5.6%
Transport and Storage	5,699	9.5%	5,717	8.2%	11,416	8.8%
Communication Services	775	1.3%	962	1.4%	1,737	1.3%
Finance and Insurance	1,149	1.9%	888	1.3%	2,037	1.6%
Ownership of Dwellings	0	0.0%	9,119	13.1%	9,119	7.0%
Business Services	4,345	7.2%	2,719	3.9%	7,064	5.4%
Public Administration	3,766	6.3%	646	0.9%	4,412	3.4%
Education	4,893	8.1%	691	1.0%	5,584	4.3%
Health	4,509	7.5%	910	1.3%	5,418	4.2%
Recreational Services	1,864	3.1%	525	0.8%	2,389	1.8%
Personal Services	891	1.5%	472	0.7%	1,362	1.0%
TOTAL	60,100	100.0%	69,807	100.0%	129,907	100.0%

[a] Wages and salaries and other payments to labour including overtime payments and income tax, but excluding payroll tax.
[b] Includes gross operating surplus and all taxes, less subsidies.
[c] The value of output less the cost of goods and services (including imports) used in producing the output.
[d] Beef, dairy, eggs, honey.
[e] Hay, grapes, vegetables, orchard fruit, pasture, services to agriculture.

Source: EconSearch analysis.

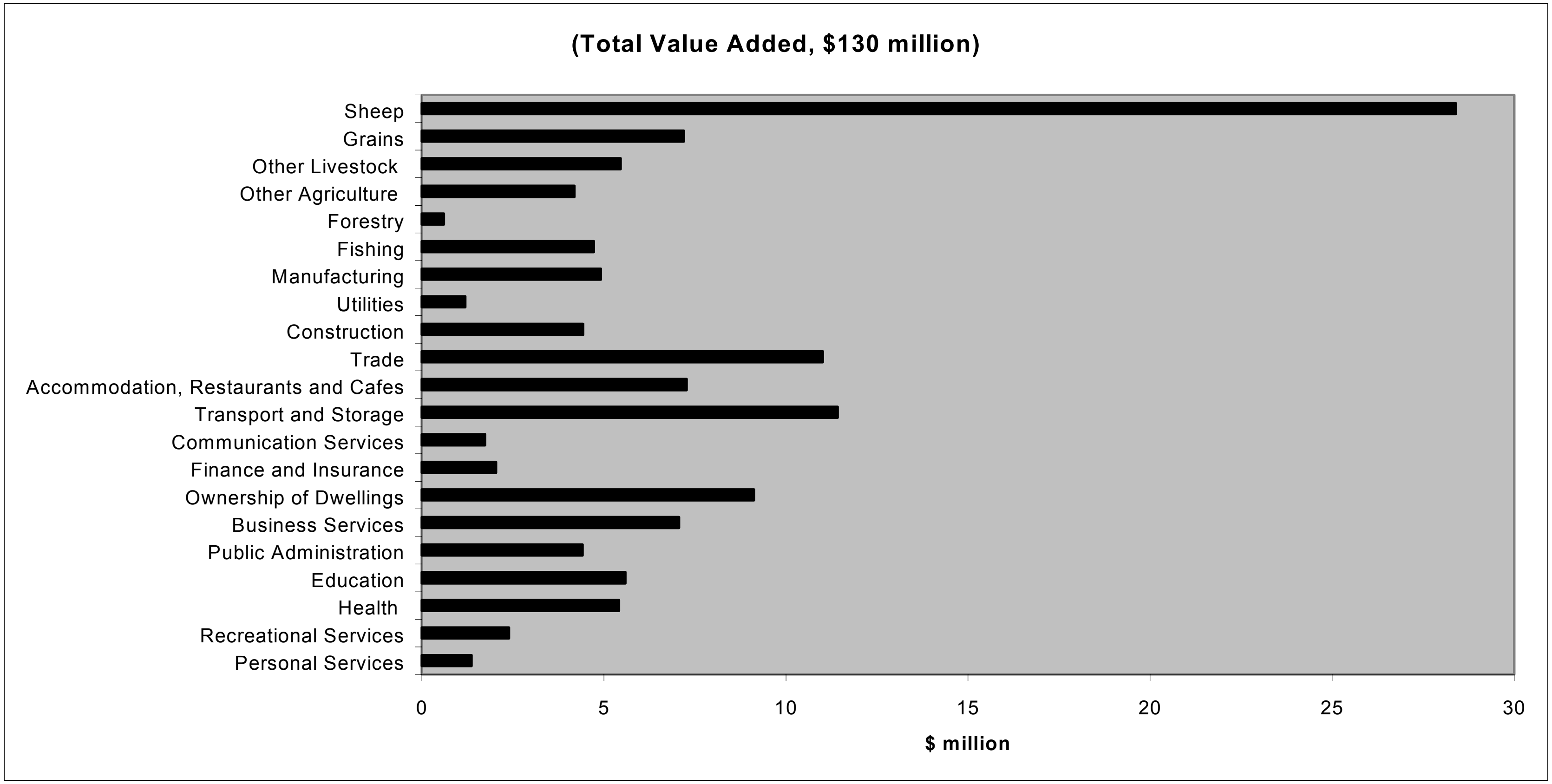
Figure 2.1 Value of output by sector, Kangaroo Island, 2001/02



Source: EconSearch analysis.

- The agriculture sectors together directly contribute 31.2 per cent ($70 million) of the total value of regional production ($224 million).
- Sheep (wool and prime lambs) is the most important sector, producing output valued at over $44 million, almost 20 per cent of the total gross output for the region.
- Transport and storage (10.2 per cent), trade (9 per cent), manufacturing (8.6 per cent) and accommodation, restaurants and cafes (7.2 per cent) are also significant contributors to regional output.

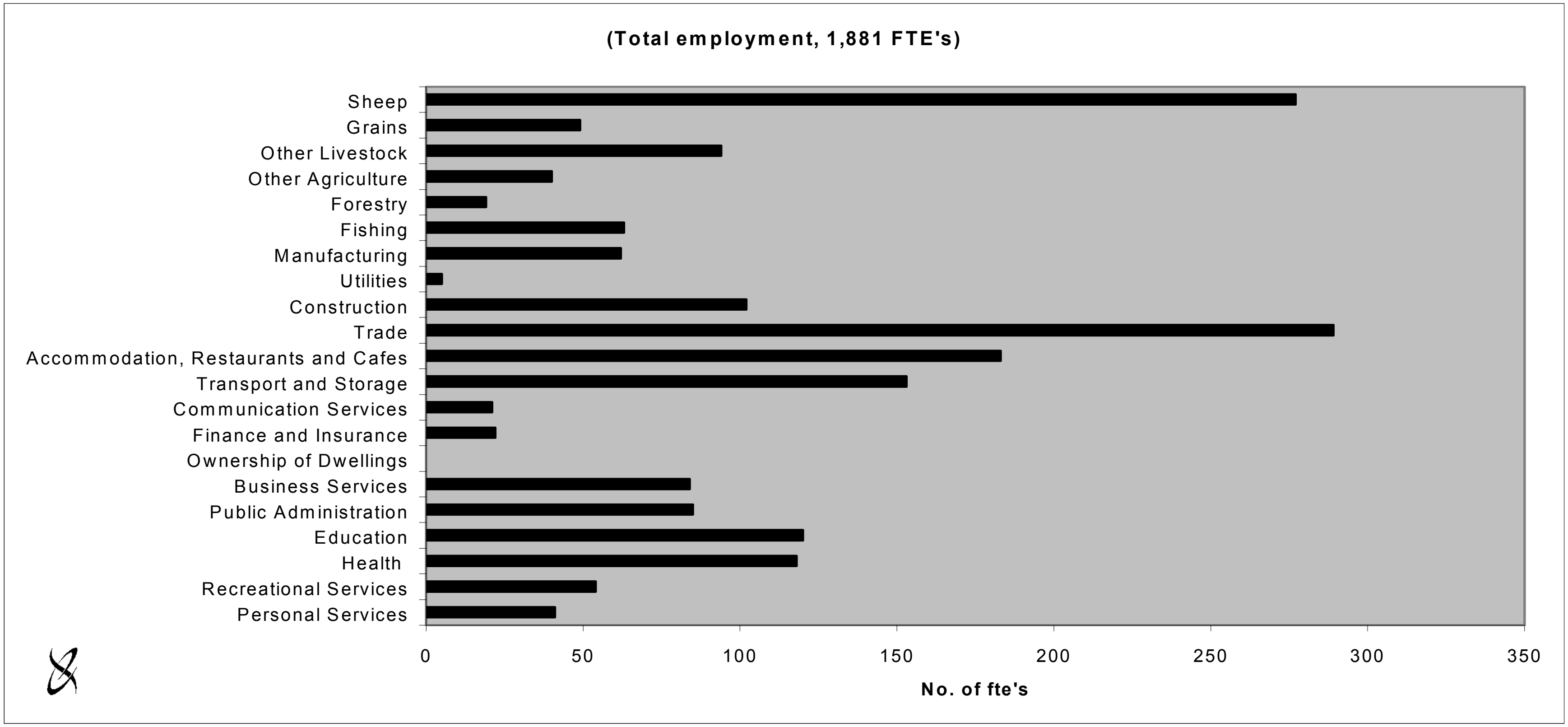
Figure 2.2 Value added by sector, Kangaroo Island, 2001/02.



Source: EconSearch analysis.

- The agriculture sectors together directly contribute 34.8 per cent ($45 million) of the regional value added ($130 million).
- The sheep (wool and prime lambs) sector contributes 21.9 per cent of the regional value added.
- Transport and storage (8.8 per cent), trade (8.5 per cent), ownership of dwellings (7.0 per cent) and accommodation, restaurants and cafes (5.6 per cent) are also significant contributors to regional value added.

Figure 2.3 Employment by sector, Kangaroo Island, 2001/02



Source: EconSearch analysis.

- The agriculture sectors together directly contribute 24.4 per cent (460 fte) of regional employment (1,881 fte).
- The trade sector (15.4 per cent) has the highest share of the workforce.
- The sheep (14.7 per cent), accommodation, restaurants and cafes (9.7 per cent) and transport and storage (8.1 per cent) are also significant contributors to regional employment.

2.3 Current Conditions and Outlook for Key Sectors

2.3.1 Tourism

Visitor Characteristics

Table 2.5 below summarises the recent information available with respect to tourism levels on Kangaroo Island. This data is derived from the TOMM database. The total visitation is estimated from passenger counts at the airport and SeaLink terminals. The proportion of visitor by group is estimated from the outcomes in the TOMM survey database.

Table 2.5 Estimated number of visitors to Kangaroo Island, 2001

Visitor Group	Day Trips	Overnight Visits	Visitor Nights	Average Nights per Visit
International	7,232	34,762	76,477	2.2
Interstate	4,083	35,462	161,708	4.6
Intrastate	3,266	53,194	247,350	4.7
Total	14,582	123,418	485,536	na

Source: Hudson Howell and Economic Research Consultants 2002.

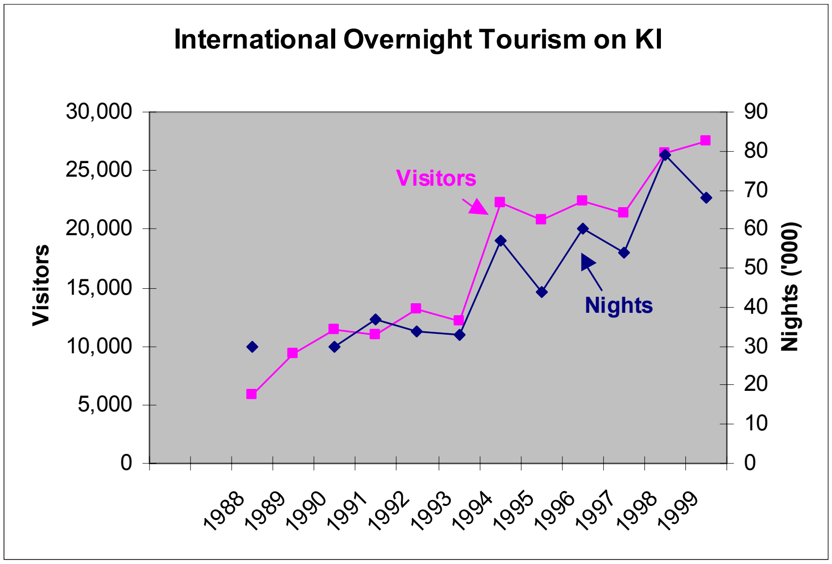
Using the TOMM estimates, Kangaroo Island attracts almost 140,000 visitors per year, with a little over 10 per cent as day trips and the balance in overnight stays. It should be noted that there are variations in estimates from alternative data sources (e.g. Bureau of Tourism Research (BTR) based Domestic Tourism Monitor and International Visitor Survey based estimates). The TOMM database and transport system counts are thought to be more reliable in this context because the BTR based surveys have high standard errors at small area levels[6].

Despite this issue, it is worthwhile to consider the role of Kangaroo Island in the state's tourism profile. Table 2.5 indicates that international tourism is responsible for 15 per cent of visitor nights on KI and 50 per cent of day trips. Figure 2.4 illustrates the growth of international tourism over the last decade. The numbers of visitors has an underlying growth rate of 12 per cent per annum in visits[7], while nights grew by an average 9 per cent per annum (implying a slow decline in the average length of stay). Over the same period, the growth rate in international tourism to the State as a whole has been 2.8 per cent per annum in terms of visitors and 2.1 per cent per annum in terms of visitor nights.

[6] Nevertheless, the difficulties with the TOMM database and data collection methods are acknowledged and it is recognised that the reliability of the estimates provided in this report would be improved with more reliable estimates of visitor numbers and visitor expenditures.

[7] Growth rate calculated through the use of an exponential regression, therefore avoiding the implications of particular starting or ending points.

Figure 2.4 International overnight tourism on KI



Source: Hudson Howell and Economic Research Consultants 2002.

Visitor Expenditure Characteristics

There is limited information available on visitor expenditure, particularly detailed expenditure profiles by item. Hudson Howell and Economic Research Consultants (2002) used a modelling approach to provide estimates of expenditure patterns of tourism associated with visitation to Kangaroo Island and to distribute the expenditures to items of expenditure. The estimates are provided in Table 2.6.

Table 2.6 Estimates of average expenditure associated with Kangaroo Island visitation, 2001

Average spend (per night) by category ($)	International				Interstate				Intrastate			
	Day Trip		Overnight trip		Day Trip		Overnight trip		Day Trip		Overnight trip	
	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip
Transport - to Island	196.5	0.0	111.4	0.0	141.1	0.0	29.0	0.0	81.2	0.0	21.4	0.0
Accommodation	0.0	0.0	111.4	20.2	0.0	0.0	29.0	11.1	0.0	0.0	21.4	10.9
Meals, Food and Drinks	28.1	18.1	13.9	25.2	20.2	30.6	3.6	13.9	11.6	34.9	2.7	13.6
Organised Tours/Day Trips	28.1	6.0	13.9	5.0	20.2	10.2	3.6	2.8	11.6	11.6	2.7	2.7
Other Entertainment Costs	0.0	6.0	13.9	5.0	0.0	10.2	3.6	2.8	0.0	11.6	2.7	2.7
Transport - on Island	28.1	15.1	13.9	25.2	20.2	25.5	3.6	13.9	11.6	29.1	2.7	13.6
Personal Services	0.0	6.0	0.0	5.0	0.0	10.2	0.0	2.8	0.0	11.6	0.0	2.7
Other Expenditure	0.0	9.1	0.0	15.1	0.0	15.3	0.0	8.3	0.0	17.4	0.0	8.2
Total Spend	280.8	60.4	278.5	100.9	201.6	102.0	72.4	55.6	116.0	116.3	53.4	54.6

Source: Hudson Howell and Economic Research Consultants 2002.

It was estimated that international visitors spend considerably more than interstate and intrastate visitors, particularly in the areas of transport and accommodation. The expenditure patterns of intrastate and interstate visitors are similar, the major difference being the expenditure by day-trip visitors on transport to the island.

Travel expenditure is the major item for day-trip visitors, as well as being important for overnight trip visitors.

Combining the information from Tables 2.5 and 2.6 provides an estimate of the aggregate expenditure pattern associated with visitation to Kangaroo Island (i.e. visitor numbers by length of stay by expenditure by item). The results of this are illustrated in Table 2.7 and Figure 2.5. The estimated results suggest the following.

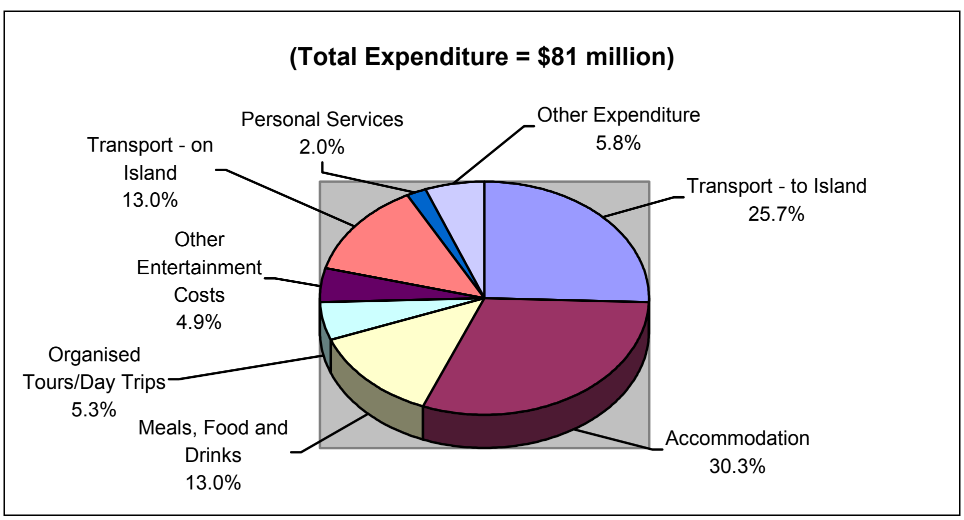
- The total estimated expenditure in 2001 associated with tourist visitation to Kangaroo Island was estimated at $81 million.
- Transport costs to the Island accounted for 26 per cent of visitor expenditures to the Island
- International visitors contributed 39 per cent of tourism-related expenditure. Transport to the island represented 32 per cent of tourism-related expenditure by international visitors.

Table 2.7 Estimated aggregate visitor expenditure by category, 2001 ($ million)

Aggregate spend by category ($)	International				Interstate				Intrastate				Total
	Day Trip		Overnight trip		Day Trip		Overnight trip		Day Trip		Overnight trip		
	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	
Transport - to Island	1.42	0.00	8.52	0.00	0.58	0.00	4.69	0.00	0.27	0.00	5.28	0.00	20.75
Accommodation	0.00	0.00	8.52	1.54	0.00	0.00	4.69	1.80	0.00	0.00	5.28	2.70	24.53
Meals, Food and Drinks	0.20	0.13	1.06	1.93	0.08	0.12	0.59	2.25	0.04	0.11	0.66	3.37	10.55
Organised Tours/Day Trips	0.20	0.04	1.06	0.39	0.08	0.04	0.59	0.45	0.04	0.04	0.66	0.67	4.27
Other Entertainment Costs	0.00	0.04	1.06	0.39	0.00	0.04	0.59	0.45	0.00	0.04	0.66	0.67	3.94
Transport - on Island	0.20	0.11	1.06	1.93	0.08	0.10	0.59	2.25	0.04	0.09	0.66	3.37	10.49
Personal Services	0.00	0.04	0.00	0.39	0.00	0.04	0.00	0.45	0.00	0.04	0.00	0.67	1.63
Other Expenditure	0.00	0.07	0.00	1.16	0.00	0.06	0.00	1.35	0.00	0.06	0.00	2.02	4.72
Total	2.03	0.44	21.30	7.72	0.82	0.42	11.71	8.98	0.38	0.38	13.21	13.50	80.89

Source: Tables 2.5 and 2.6.

Figure 2.5 Tourism expenditure related to KI visitation by category, 2001



Tourism Contribution to the Island Economy

Not all expenditure on tourism on Kangaroo Island occurs on the island or indeed, in the case of interstate and international tourism, in South Australia. For example, an interstate visitor to KI may pay for their transport and accommodation as a package, of which a margin will go to the travel agent in the visitor's home city. Further travel to KI will induce expenditure both on the island and in Adelaide.

This factor was modelled with distributions of various expenditures to Kangaroo Island, other SA and out-of the state. The distributions outlined are described in Hudson Howell and Economic Research Consultants (2002) and summarised in Table 2.8 and Figure 2.6. It was estimated that $53 million of the $81 million expenditure (65 per cent) associated with visitation to Kangaroo Island actually occurs on the island. The biggest leakage is in transport to KI, where it was estimated that only 37.5 per cent occurs on the island.

Table 2.8 Estimated expenditure on Kangaroo Island due to visitation, 2001 ($m)

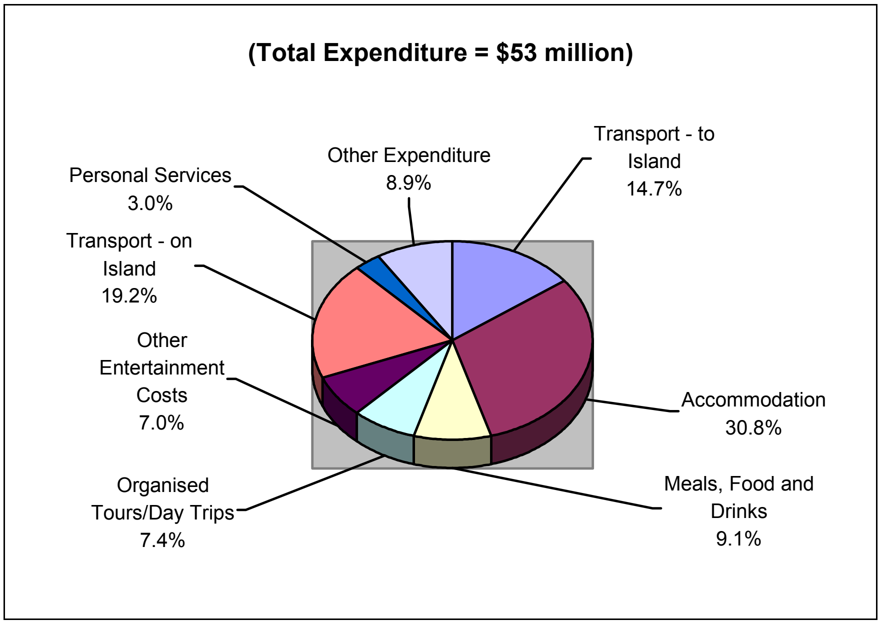
Aggregate Expenditure on Kangaroo Island	International				Interstate				Intrastate				Total
	Day Trip		Overnight trip		Day Trip		Overnight trip		Day Trip		Overnight trip		
	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	Pre-trip	On-trip	
Transport - to Island	0.43	0.00	2.56	0.00	0.23	0.00	1.87	0.00	0.11	0.00	2.64	0.00	7.83
Accommodation	0.00	0.00	6.81	0.00	0.00	0.00	4.22	0.00	0.00	0.00	5.28	0.00	16.32
Meals, Food and Drinks	0.06	0.07	0.32	0.97	0.02	0.06	0.18	1.12	0.02	0.06	0.26	1.69	4.82
Organised Tours/Day Trips	0.16	0.04	0.85	0.39	0.07	0.04	0.53	0.45	0.04	0.04	0.66	0.67	3.95
Other Entertainment Costs	0.00	0.04	0.85	0.39	0.00	0.04	0.53	0.45	0.00	0.04	0.66	0.67	3.67
Transport - on Island	0.16	0.11	0.85	1.93	0.07	0.10	0.53	2.25	0.04	0.09	0.66	3.37	10.17
Personal Services	0.00	0.04	0.00	0.39	0.00	0.04	0.00	0.45	0.00	0.04	0.00	0.67	1.63
Other Expenditure	0.00	0.07	0.00	1.16	0.00	0.06	0.00	1.35	0.00	0.06	0.00	2.02	4.72
Total	0.81	0.37	12.25	5.21	0.40	0.35	7.85	6.06	0.19	0.32	10.17	9.11	53.11

Source: Hudson Howell and Economic Research Consultants 2002.

Modelling outcomes based on expenditure data in the TOMM database and Hudson Howell and Economic Research Consultants (2002) drew the following conclusions.

- Visitor expenditure associated with tourism to Kangaroo Island was estimated to be $81 million.
- The expenditure by visitors that occurs on KI itself was estimated to be $53 million (i.e. 65 per cent of total expenditure). Using estimated multipliers for the KI economy this leads to income creation (in terms of value added) on the island of $40 million, wages and salaries of $20 million and 650 full-time equivalent jobs.
- It was also estimated that the attraction of Kangaroo Island as a tourist destination is estimated to contribute additional value added of $38 million to the South Australian economy and support an additional 550 jobs in the state. This represents almost 2 per cent of the value of economic activity associated with SA tourism.
- There are additional investment outcomes in the provision of tourism services on Kangaroo Island not included in the modelling that are estimated to provide additional value added impacts at the state level of some $4.5 million and 70 jobs.

Figure 2.6 Estimated expenditure on Kangaroo Island related to visitation - by category, 2001



2.3.2 Agriculture

Historically, Kangaroo Island's economy has been based on agriculture, in particular, wool production. While tourism is becoming an increasingly important industry to the island, agriculture remains the major contributor to KI's economic wealth and job creation (Tables 2.3 and 2.4, Figures 2.1 to 2.3).

The value of KI's agricultural production is summarised in Table 2.9. In 2001/02, the gross value of KI's agricultural production was estimated to be almost $69 million. Livestock (wool, sheep and cattle) accounted for approximately 75 per cent of the estimated production value. Cropping industries accounted for around 18 per cent of production. While there have been some attempts to diversify away from the traditional livestock and cropping industries (e.g. honey, eggs, viticulture), these new industries remain very small.

Sheep for wool production have traditionally dominated livestock numbers. Since the collapse of the reserve price scheme in 1991, coupled with a downturn in wool prices, cattle and prime lambs numbers on the island have increased. Wool production continues to generate the highest value of production, however, being around $25 million in 2001/02 (Table 2.9). The value of prime lamb production to the KI economy has increased markedly in recent years. In 1996/97, gross value of production for prime lambs was estimated to be around $6.5 million, increasing to $19.7 million in 2001/02.

Table 2.9 Value of agricultural production: Kangaroo Island (1996/97[a]-2001/02[b])

	No. of head		Production[c]		Area harvested (ha)		No. of producers		Average Price ($/unit)		Gross value of production ($'000)	
	1996/97	2001/02	1996/97	2001/02	1996/97	2001/02	1996/97	2001/02	1996/97	2001/02	1996/97	2001/02
Wool	-	-	4,407	4,756	-	-	311	272	4,416	5,180	19,462	24,637
Sheep[d]	864,441	805,443	262,456	358,376	-	-	310	256	25	55[e]	6,527	19,730
Cattle	16,275	24,727	8,433	10,183	-	-	153	139	270	749	2,273	7,624
Wheat	-	-	2,136	16,778	913	6,163	36	66	215	182	460	3,054
Oats	-	-	12,661	9,781	6,953	4,534	161	94	123	138	1,559	1,350
Canola	-	-	1,613	11,833	1,720	8,009	41	79	405	375	654	4,437
Barley	-	-	5,690	6,339	3,157	3,666	68	71	186	173	1,061	1,097
Cereals for hay	-	-	12,954	11,035	3,064	3,971	128	58	118	158	1,532	1,744
Legumes	-	-	1,089	3,786	844	2,437	31	58	237	243	258	921
Other agriculture[f]	-	-	-	-	-	-	-	-	-	-	3,239	4,142
Total agriculture	-	-	-	-	-	-	-	-	-	-	37,026	68,736

[a] ABS Agstats data (1996/97).
[b] ABS Agstats data (2000/01), updated with production and area data from *KI Primary Producers Audit* (Truscott Research 2002) and price data from KI Agri-Food Industry Scorecard (PIRSA Food for the Future, 2001/02, customised data request).
[c] Units of production - wool (total tonnes), sheep and cattle (no of head sold), cropping (total tonnes).
[d] The changes from 1996/97 and 2001/02 reflect a significant increase in fat lamb production and livestock prices over that period.
[e] Ave. price ($/head) for sheep is a weighted average of price estimates for prime lambs and adult sheep (including sale of skins).
[f] Includes dairy, eggs, honey, pigs, grapes, vegetables, orchard fruit and pasture.

Source: EconSearch analysis.

Cattle numbers, primarily for beef production, have declined significantly since the mid 1970's, when close to 60,000 head were held on the island (KPMG and Rust PPK 1994, p. 30). Cattle numbers dropped due to movements into cropping and wool production. At present, cattle numbers are estimated to be around 25,000 head (Table 2.9). Industry representatives indicated that smaller herds on the island are starting to build up and that there are already several established larger cattle producers on the island. Beef production is becoming increasingly popular because cattle are perceived to be easier to handle than sheep. In addition, the availability of casual labour on KI is decreasing, therefore beef production is becoming more attractive because it is a less labour intensive than wool and prime lamb production.

Cereal production has generally occurred on mixed cropping and livestock farms. Historically, the main crops produced on KI have been wheat, oats and barley, however canola has become increasingly important in more recent years. In 1996/97, approximately 1,600 tonnes of canola was produced, increasing to 11,833 tonnes in 2001/02 (Table 2.9). Kangaroo Island has traditionally produced relatively small volumes of grain because it is expensive to transport and cannot be moved readily at short notice (QED 1999, p. 27). However, annual grain production, particularly wheat and canola, has increased markedly during recent years due to higher grain prices and price downturns in the wool and sheep meat industries.

2.3.3 Fishing and aquaculture

Kangaroo Island supports a relatively small, but viable commercial fishing industry. Rock lobster, abalone and marine scalefish are the main species fished in Kangaroo Island waters. In 2001/02, gross value of production for KI's fishing sector (abalone, rock lobster and marine scale enterprises) was estimated to be approximately $7.6 million (EconSearch 2003).

Land-based aquaculture, particularly yabby and marron cultivation also occurs on the island. Off-shore aquaculture includes the cultivation of oysters (QED 2002, p. 12).

Wild catch industry representatives indicated that any growth in the industry is expected to be in land and offshore-based aquaculture, rather than wild catch fishing. A rock lobster industry representative indicated that there would be no industry growth in the foreseeable future, because the Northern Zone rock lobster fishery is moving to a quota system. Under the quota system, the volume of lobster caught in KI waters could be expected to drop. At present, twenty rock lobster boats operate out of Kangaroo Island. With the introduction of the quota system, is it expected that some fishers will sell their quota and exit the industry.

A marine scalefish industry representative indicated that fish catches have remained relatively stable during the past several years. Growth of the marine scale industry will only result, therefore, from increases in product price. According to the industry representative, whiting has significantly increased in value in recent years with fishers currently receiving around $15 per kg. In June 1999, the whiting price was around $7.50 per kg. Lower value fish, like garfish, however, are also increasing in value, which could reduce the pressure on fishers to catch only higher value species such as whiting.

2.3.4 Forestry

To date, KI's forestry industry has been small in comparison with other primary production sectors (i.e. agriculture and fishing), contributing less than 1 per cent (approximately $1 million) to gross regional product in 2001/02 (Table 2.3). However, it is noted that the industry is yet to realise its full value as first harvesting is not due to commence until 2004. Over the past 5 years, in excess of $40 million has been invested in the establishment of two-thirds of the existing estate (Anthea Howard, Kangaroo Island Regional Plantation Committee, pers. comm.). This investment is not taken into account in Table 2.3.

KI's plantation forestry industry currently consists of a 10,228 ha estate[8], comprised of approximately 5,439 ha of Tasmanian blue gum (*Eucalyptus globulus*), 4,392 ha of Radiata pine (*Pinus radiata*) and 457 ha of Shining gum (*E. nitens*) (Anthea Howard, Kangaroo Island Regional Plantation Committee, pers. comm.).

In excess of 80,000 ha of the island has been identified as suitable for forestry. Furthermore, KI offers very competitive land prices in comparison to the mainland. The industry is therefore aiming to develop a 30,000-40,000 ha plantation estate (KIDB 2003).

Four companies are currently involved in KI's forestry industry. They are actively involved in developing infrastructure to support the development of the forestry industry, including timber processing and loading facilities, to enable on-island value adding and cost effective export of wood products from the island (KIDB 2003).

The freight task for transporting woodchips produced from Tasmanian blue gum exceeds the scope of freight services suitable and presently available on KI. The industry recognises the need to develop appropriate bulk commodity cross modal transport facilities to support its operation and is actively addressing this issue.

The future development of the softwood sector is uncertain. However, the availability of more competitive freight services would increase the expected returns on new plantations. This, in turn, would increase the likelihood of existing plantations proceeding to second rotation, as well as improving the potential for expansion of the softwood sector.

[8] At the conclusion of 2002 plantings.

3. Transport in the Kangaroo Island Economy

3.1 Overview of Transport Issues

Kangaroo Island is highly dependent on intermodal land-sea transport for the import of goods from the mainland and the export of primary and other products from the island to mainland markets.

SeaLink Kangaroo Island Ferries (SeaLink) operates the primary sea transportation ferry service between mainland South Australia and Kangaroo Island. In addition to providing all vehicle ferry services and most freight services, SeaLink transports approximately 70 per cent of passengers to and from KI (QED 1999, p. 7). KI's remaining passengers and a small volume of time sensitive freight are transported by air. Ausbulk provides a competing seasonal grain barge service, transporting approximately 20,000 tonnes of grain annually from Kingscote to Port Adelaide (Department of Transport and Urban Planning 2003, p.2).

SeaLink currently operates two ferries between Cape Jervis and Penneshaw. The MV Island Navigator carries freight loaded on trucks including dangerous goods (i.e. fuel), motor vehicles and up to 195 passengers. The MV Sealion 2000 is a larger vessel carrying limited categories of freight, motor vehicles and up to 355 passengers. Each vessel runs all year round with 4-5 returns trips made daily during the peak season (November-April) and 2 return trips daily in the off-peak winter months.

A number of key transport-related issues (discussed below) have been explored in studies conducted by QED (1999), Department of Transport and Urban Planning (2003) and Truscott Research (2002). Issues such as these have prompted the Kangaroo Island Development Board to investigate the veracity of the argument that the cost of passenger and freight transport between the mainland and KI is a key determinant of business viability and overall economic development on the island.

3.1.1 Freight cost

Transport between KI and mainland markets (Adelaide) is considered to be relatively expensive as a result of the land distance, the sea crossing costs and the relatively low population/economic base on KI (QED 1999, p. 1). Concerns exist that the relatively high cost of freight and passenger transport to and from the mainland restricts economic development on Kangaroo Island, particularly in the primary production and tourism sectors.

In the *Kangaroo Island Primary Producers Audit* (Truscott Research 2002), approximately 170 primary producers (51 per cent of total responses) across a range of industries indicated that the cost of freight is the main problem or challenge facing their industry[9]. Six per cent of respondents indicated that the timing and availability of freight services was a major issue.

[9] A total of 334 primary producers participated in the *Kangaroo Island Primary Producers Audit* (Truscott Research 2002) from the following industries – wool, prime lambs, cropping, beef cattle, aquaculture/fishing, viticulture, forestry/agro-forestry, olives, seed potatoes, apiary and other primary industries. Whilst every effort was made by Agriculture KI and PIRSA to compile a fully comprehensive database, it should be recognised that some producers may have been inadvertently omitted from the sample selection, whilst others included in the sample may not have been available to participate in the survey. The participation and production figures quoted in the report are indicative only.

Some stakeholder organisations raised concerns in the *Kangaroo Island Freight Strategy Study* (QED 1999) about SeaLink's high cost for freight services relative to similar ferry services provided elsewhere in Australia. They were of the opinion that a subsidy, similar to that provided for the Tasmania ferry service, should be introduced which recognises the ferry as a Government-provided arterial road, such that transport across Backstairs Passage would essentially be "free" (QED 1999, p.14).

Alternatively, other stakeholders indicated that they considered the SeaLink ferry service costs to be reasonable and a trade-off for choosing to live and conduct business on the island. As residents and tourists alike, are often attracted to the island's remoteness, this group believed that other tax payers should not have to subsidise the life style and business choices of Kangaroo Island residents (QED 1999, p. 14; Department of Transport and Urban Planning 2003, p.9).

3.1.2 Under-utilisation of capacity

Stakeholders have indicated that SeaLink provides a good level and quality of service, however capacity is an issue. Although average utilisation of available capacity is generally low at approximately 30 per cent for passengers, 40 per cent for freight and 50 per cent for vehicles, during peak times there is little or no spare capacity (Department of Transport and Urban Planning 2003, p.2). During peak times, therefore, passengers and their vehicles take precedence over freight, with freight transport being held off if there is insufficient space to carry all vehicles.

3.1.3 Transport inefficiencies

SeaLink transports in excess of 17,000 metres of empty trailers in a year, because a higher volume of freight is exported from the island than is imported. A lack of back loads lead to transport inefficiencies that translate into higher transport costs (QED 1999, p. 23).

Further transport inefficiencies result from down time associated with ferry travel (i.e. marshalling, loading, travel time), short travelling distances, over-capitalisation and aging equipment.

3.1.4 Lack of competition

Over the years, several proposals have been submitted to the South Australian Government from parties wishing to operate competing ferry services between the mainland and KI. Consideration of these proposals raised issues regarding port infrastructure and the operation of services between Cape Jervis and Penneshaw.

The *Kangaroo Island Ferry Links Issues Paper* (Department of Transport and Urban Planning, 2003) was prepared to assist the State Government to determine if any further action should be taken to address these issues. Modelling conducted by PPK and Thompson Clarke Shipping indicated that the introduction of a direct competitor to SeaLink on the Cape Jervis to Penneshaw route could result in commercial failure of one of the services. Furthermore, the level of service currently provided by SeaLink could be reduced or down graded (Department of Transport and Urban Planning 2003, p. 6).
Some Kangaroo Island residents have expressed concern at the risks that the introduction of a competing ferry service may evoke, while others support competition.

QED (1999, p. 3) found that a second (competitive) ferry operator providing passenger or freight services could result in higher freight costs, because a competitive passenger service would reduce SeaLink's ability to cross subsidise freight rates and add significantly to the existing spare freight capacity.

3.2 Enterprise Profitability and Transport Costs in Key Sectors

Interviews were held with representatives from KI's agriculture, fishing, forestry and tourism sectors to assess whether the cost of transport is a critical determinant of industry viability and future growth and development.

Cost and return information was gathered from industry representatives and used to develop representative models to assess enterprise viability and the significance of transport costs.

Industry representatives identified key factors constraining industry growth and development on Kangaroo Island, making specific comments on the impact of transport costs and how industry growth would be affected by a reduction in such costs.

3.2.1 Cropping

Representative gross margin models were developed for typical wheat, oats and canola enterprises on Kangaroo Island and are summarised in Table 3.1. Representative gross margins models for individual cropping enterprises are provided in Appendix 3.

Profitability

Each representative KI cropping enterprise generates a positive gross margin. Canola generates a gross margin of $321/ha, which is almost 23 per cent higher than wheat ($260/ha) and 15 per cent higher than oats ($279/ha). Although yield per hectare for canola is lower than the other cropping enterprises (1.7 tonnes/ha compared with 3.2 tonnes/ha), canola is a much higher value crop, currently selling for an average price of $400 per tonne, compared with less than $200 per tonne for wheat and oats (Table 3.1).

Freight Cost

In comparison to livestock and fishing enterprises, freight costs account for a significant proportion of gross revenue of cropping enterprises. Total freight cost as a proportion of gross revenue is highest for the wheat enterprise being 28.8 per cent, compared with 11.9 per cent for canola and 9.2 per cent for oats. Freight cost accounts for a smaller proportion of gross revenue for canola than wheat, because higher gross revenue is generated and lower yields per hectare result in a smaller volume of product being transported. A significant proportion of oats produced on KI is retained for on-farm use. Total freight costs for oats therefore account for a lower proportion of gross revenue for than wheat or canola enterprises.

Table 3.1 Summary gross margins for Kangaroo Island broadacre cropping enterprises

	Wheat	Canola	Oats [e]
INCOME			
Yield (tonne/ha)	3.2	1.7	3.2
Price ($/tonne)	190	400	150
GROSS INCOME ($/ha)	608	680	480
VARIABLE COSTS ($/ha)			
Seed and seed treatments	29	16	23
Fertilisers	96	115	86
Chemicals	39	42	12
Operations	33	44	28
Freight - Grain			
Road [a]	29	15	10
Sea [b]	102	54	27
Total	131	70	37
Freight - Fertiliser [c]			
Road	5	6	4
Sea [d]	4	5	3
Total	9	11	7
Insurance and levies	11	17	8
Contract work	-	45	-
TOTAL VARIABLE COSTS ($/ha)	348	359	201
GROSS MARGIN ($/ha)	260	321	279
Sea freight as a proportion of gross income	17.5%	8.8%	6.3%
Road freight as a proportion of gross income	5.5%	3.1%	2.9%
Total freight as a proportion of gross income	23.0%	11.9%	9.2%

[a] Based on road freight cost from farm-gate to Kingscote of $9.00 per tonne.
[b] Based on sea freight cost from Kingscote to Port Adelaide by barge of $32.00 per tonne.
[c] Based on average total freight cost from Port Adelaide to KI of $37.00 per tonne.
[d] Based on return sea freight cost from Cape Jervis to Penneshaw of $462.28 or $17.80 per tonne (9.1m trailer carrying 26 tonnes per load @ $25.40 per linear metre (one way) with SeaLink).
[e] Assuming 65% of oats are retained on farm and 35% are sold (25% to KI farms, 75% off island).

Source: EconSearch analysis.

For each cropping enterprise, the sea cost component of total freight generally exceeds the cost of road freight. If grain is transported from Kingscote to Port Adelaide using the seasonal barge service provided by Ausbulk, the sea freight cost is, on average, $32.00 per tonne, whilst the road freight cost for carting grain from the farm-gate to Kingscote is about $9 per tonne. If grain is transported by truck to Port Adelaide at a cost of $30 per tonne (with a superphosphate back load), the sea freight cost is $17.80 per tonne[10] compared to road freight cost of $12.20. Similarly, for superphosphate carted as a back load ($27 per tonne), sea freight costs ($17.80 per tonne) are greater than road freight costs ($9.20 per tonne). Alternatively, if a truck travels empty one-way when carting superphosphate ($47 per tonne), the road freight costs ($29.20 per tonne) then exceed the sea freight costs ($17.80).

Industry Perspective

Cropping industry representatives indicated that freight cost is the most significant factor constraining growth and development of the cropping industry on KI, particularly at times when grain prices or yields are low, when up to 40 per cent of gross income can be consumed by freight costs.

Industry representatives indicated that land suitable for grain production is available on KI. However, it was felt that transport costs would need to fall before more land would be developed for cropping. If transport costs remain at current levels, grain export volumes are likely to remain constant. A shift will continue to occur, however, from the production of traditional, low-value crops such as barley and oats to higher value, more highly segmented grain products such as canola.

If freight costs between KI and Port Adelaide for grain were to reduce, land values could be expected to rise due to an increase in demand for cropping land from existing KI primary producers and interested mainland parties. Industry representatives indicated that land suitable for cropping on KI is currently valued at around $1,200 per hectare compared with $3,200 per hectare at Maitland, for example.

As mentioned, grain is currently shipped from Kingscote to Port Adelaide using a seasonal barge service provided by Ausbulk or alternatively, is trucked from Kangaroo Island. Industry representatives indicated that introduction of the barge service lowered grain freight costs by $10 per tonne to around $30-35 per tonne. If freight costs were to reduce by a further $10-15 per tonne, freight costs would then be comparable with mainland rates ($12-15 per tonne).

3.2.2 Livestock

Representative gross margins models were developed for typical wool, prime lamb and beef enterprises on Kangaroo Island and are summarised in Table 3.2. Detailed representative gross margins models for livestock enterprises are provided in Appendix 3.

10 The SeaLink freight charge per linear metre is $25.40 one-way. Bulk haulage trailers are 9.1m long and carry 26 tonnes per load. The total cost of a return trip carting grain or superphosphate is therefore $462.28 or $17.80 per tonne.

Table 3.2 Summary gross margins for Kangaroo Island livestock enterprises

	BEEF	WOOL	PRIME LAMBS
ENTERPRISE DETAILS			
Area (ha)	189	167	184
Total DSE's	1,891	2,000	1,840
Number of breeders	100	833	1,000
INCOME ($)			
Wool	-	60,064	36,155
Stock sales	41,998	30,158	75,118
GROSS INCOME ($)	41,998	90,222	111,273
VARIABLE COSTS ($)			
Shearing	-	8,990	5,148
Stock purchases	2,500	3,300	29,000
Animal health	1,822	2,995	2,468
Freight - Stock [a]			
Road	2,080	2,319	6,096
Sea	1,071	1,091	2,694
Total	3,150	3,410	8,790
Freight - Wool [b]			
Road	-	381	186
Sea	-	339	210
Total	-	720	396
Freight - Superphosphate [c]			
Road	269	240	265
Sea	249	223	246
Total	518	463	511
Commission and levies	2,404	2,170	5,586
Feed	7,920	10,096	11,400
Fertiliser	5,810	5,188	5,727
Other	-	2,740	2,124
TOTAL VARIABLE COSTS ($)	24,124	40,071	71,150
TOTAL GROSS MARGIN ($)	$17,874	$50,151	$40,123
GROSS MARGIN / HA ($)	$95	$301	$218
Sea freight as a proportion of gross income	3.1%	1.8%	2.8%
Road freight as a proportion of gross income	5.6%	3.3%	5.9%
Total freight as a proportion of gross income	8.7%	5.1%	8.7%

[a] Based on total freight cost per head of $5.00 for sheep, $4.50 for lambs, $45.00 for cattle and $30.00 for calves.

[b] Based on total freight cost of $12.00 per bale of wool.

[c] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with back load, $47.00 per tonne without back load).

Source: EconSearch analysis.

Profitability

Each representative KI livestock enterprise generates a positive gross margin. Wool generates a gross margin of $301/ha, which is almost 40 per cent higher than prime lamb production ($218/ha) and more than 3-fold that for beef cattle ($95/ha) (Table 3.2).

Freight Cost

Total freight cost for KI's livestock enterprises accounts for a lower proportion of gross income than cropping enterprises. The cost of freight for the wool enterprise accounts for the lowest proportion of gross income of the livestock enterprises modelled, being 5.1 per cent, in comparison to 8.7 per cent for the cattle and prime lamb enterprises alike. Freight cost for wool is minimal because it is a relatively high value, low volume product. Assuming an average price per bale of $1,000, the freight cost from KI to Port Adelaide of $12.00 represents only 1.2 per cent of gross income.

The road freight component of transporting livestock between KI and the mainland is higher than the sea freight component. For example, the total freight cost of transporting adult sheep is approximately $5.00 per head. The sea freight component is approximately $1.60 per head[11] while the road cost component is $3.40 per head. For wool, however, the sea freight component ($6.35 per bale)[12] of the total freight cost ($12.00 per bale) is marginally higher than the road cost ($5.65 per bale).

Industry Perspective

KI livestock industry representatives indicated that freight costs are not a significant impediment to growth for Kangaroo Island's livestock industries, particularly since stock and wool prices have increased in recent years. In comparison to cropping operations, the cost of transporting wool and stock to the mainland has only a small impact on industry profitability. Furthermore, the cost of crossing Backstairs Passage forms only a small proportion of the cost of transporting livestock to the mainland relative to road transport costs. Industry representatives believe that because KI land values are considerably lower than high rainfall land on the mainland with similar carrying capacities, higher freight costs are compensated by lower land values.

Industry representatives indicated, however, that the logistics associated with KI's transport options are an issue for livestock enterprises. KI livestock producers need to plan carefully to move stock on and off the island, because the risk of stock losing condition through transport delays is significant. SeaLink is obligated to carry freight within 36 hours of when it is required by the customer, however, during peak times industry representatives indicated that it can take up to a week to transport product off the island. Livestock travelling on the ferry are taken off food and water 36 hours prior to trucking as opposed to mainland stock that have a 24 hour curfew. In addition, livestock do not seem to travel particularly well across Backstairs Passage. KI livestock therefore often arrive at the buyer's in poorer condition than animals from the mainland, with a comparatively higher number either condemned or dead on arrival.

The high cost associated with *passenger transport* was identified as an impediment to industry growth and development. High passenger transport costs (both sea and air)

11 The SeaLink freight charge per linear metre is $25.40 one-way. Livestock trailers are 12.5m long, therefore the total cost of a return trip for carting livestock is $635.00 with SeaLink. Assuming a trailer holds 400 adult sheep, the cost of sea travel per sheep is $1.60 per head.

12 Assuming a trailer holds 100 bales of wool, the cost of sea travel per bale is $6.35.

limit opportunities for primary producers to travel to the mainland to attend field days, training courses, seminars, etc. More affordable passenger transport fares would provide primary producers with increased opportunity to participate in professional development activities that may help to improve management expertise in the industry. High passenger fares and inconvenient schedules (particularly during the off-season) also discourage mainland clients from visiting the island to view stock.

Although freight costs are not considered to be a significant impediment to growth and development of KI's livestock industry, it is believed that reduced freight costs could stimulate some level of change in the industry. Presently, most sheep and cattle herds on KI are self-replacing. If freight costs were reduced, greater opportunities would exist for trading and value-adding stock. KI producers would be more inclined to buy store stock from the mainland and fatten these on the island. Mainland livestock producers may also be more inclined to agist stock on KI. One industry representative believes that reduced freight costs would stimulate growth in the cropping industry that could, in turn, provide an opportunity for feedlotting on KI.

3.2.3 Fishing

Representative financial models were developed for typical marine scalefish and rock lobster enterprises on Kangaroo Island and are summarised in Table 3.3. Individual representative financial models for fishing enterprises are provided in Appendix 3.

Profitability

Both representative fishing enterprises generate positive cash operating surpluses. The rock lobster enterprise is more profitable, generating a cash operating surplus of $88,800 compared with $30,150 for the marine scale enterprise (Table 3.3). Depreciation and an allowance for owner-operator labour is excluded from the calculations. If these were factored into the models, profitability of the marine scalefish enterprise would be questionable.

Freight Cost

Freight cost is not an issue for the rock lobster enterprise because KI rock lobster fishers receive the same price irrespective of whether product is landed in Kingscote or the mainland (Victor Harbour). The freight cost is essentially borne by rock lobster buyers rather than fishers.

Freight cost for the marine scalefish enterprise is insignificant in comparison to other costs. Freight cost represents only 2.7 per cent of gross income. KI marine scale fishers currently sell fish to a local Kingscote processor or have fish transported to mainland markets by a local general carrying company for $6.00 per box (18kg of product per box). The sea freight component of transporting fish ($1.73 per box) is less than 30 per cent of the total cost (the road cost component is $4.27 per box).

Table 3.3 Summary costs and returns for Kangaroo Island fishing enterprises

	MARINESCALE	ROCKLOBSTER
INCOME		
Estimated catch (kg)	4,500	10,000
Average price ($/kg)	13	32
GROSS INCOME ($)	56,250	320,000
VARIABLE COSTS ($)		
Fuel	5,800	41,000
Bait/Tackle/Provisions	2,900	17,000
Labour	-	80,000
Freight [a]		
Road	1,068	-
Sea	433	-
Total freight	1,500	0
Total	10,200	138,000
FIXED COSTS ($)		
R&M	4,400	17,000
Licence fee	3,600	11,000
Other fixed costs	7,900	65,200
Total	15,900	93,200
TOTAL COSTS ($)	26,100	231,200
CASH OPERATING SURPLUS [b]	$30,150	$88,800
Sea freight as a proportion of gross income	0.8%	0.0%
Road freight as a proportion of gross income	1.9%	0.0%
Total freight as a proportion of gross income	2.7%	0.0%

[a] Total freight cost of $6.00 per box (18kg).
[b] Excludes unpaid labour.
Source: EconSearch 2003a, 2003b and KI Industry Representatives (pers. comm.).

Industry Perspective

The cost of freight is a minor issue for KI's marine scalefish industry. Industry representatives indicated that freight costs on KI for fish are similar to other remote mainland locations (e.g. Yorke and Eyre Peninsula).

The major freight-related issues for marine scalefish fishers are the inconvenience and risk associated with having only one option for transporting product to the mainland. Fish, being a highly perishable product, require prompt transport to market. As the carrying company only makes two trips per week to the mainland (Mondays and Thursdays), fishing effort is largely influenced by the carrying company's transport schedule. For example, if fish are caught on a Friday, they will not be transported until Monday and will then be sold on a Tuesday, which is 4 days after being caught.

Self-cartage of product to the mainland is not a feasible option for KI marine scalefish fishers due to the high cost of passenger transport with SeaLink. However, if the current carrier went out of business, they would have little choice but to transport product to the mainland themselves. If travel with SeaLink were cheaper, self-cartage would become a reasonable option, particularly at times when timetable problems arise with the current carrier. Fishers would also be in a better position to choose which days to fish, rather than being limited by the times that trucks travel to the mainland.

3.2.4 Forestry

Hardwood Sector

In recent years, WRF Securities Ltd and Australian Growth Ltd have commenced the establishment and development of Tasmanian blue gum (*Eucalyptus globulus*) plantations on Kangaroo Island. To date, KI's privately owned plantation estate stands at over 10,288 ha, with 5,439 ha of *E. globulus* already planted. By 2008-2010, it is expected that a 20,000 ha Tasmanian blue gum estate will be established, generating 470,000 tonnes of woodchips per year for export.

The future of KI's blue gum industry depends on investment levels and the ability to feasibly move woodchips from the island. The current transport options available on KI are unsuitable for servicing the blue gum industry's potential freight task. Access to a direct export port facility is therefore required. In undertaking due diligence prior to investing on the Island, WRF Forestry Pty Ltd completed a detailed study of freight options and costs and acquired an option to purchase the site of the former CSR gypsum loading facility at Ballast Head, to the north of American River. WRF Forestry Pty Ltd is pursuing commercial negotiations regarding the proposed development of a bulk commodity loading facility at Ballast Head with a number of port and shipping management parties.

A representative financial model was developed for a hardwood forestry (Tasmanian blue gum) enterprise on Kangaroo Island based on forecast cost and return information derived from WRF Forestry Pty Ltd's *Wholesale Forestry – Information Memorandum,* to assess potential industry viability (Table 3.4).

The representative model demonstrates that investment in hardwood forestry on KI could generate positive net returns for potential investors.

Table 3.4 Representative KI hardwood forestry enterprise (Tasmanian blue gum)

VOLUME ASSUMPTIONS				
Volume @ time of loading at port (sale)	1 m^3 roundwood=	0.5194	BDMT (bone dry metric tonnes)	
	or	0.9675	GMT (green metric tonnes)	
Volume @ harvest	1 m^3 roundwood=	1.1174	GMT (green metric tonnes)	
Volume @ time of transport to port	1 m^3 roundwood=	1.0392	GMT (green metric tonnes)	
Volume @ time of woodchip screening	1 m^3 roundwood=	1.0184	GMT (green metric tonnes)	
INCOME				
Yield at harvest (m^3/ha)	250 m^3 =	129.85	BDMT	
Price ($/BDMT)		$165.00	/BDMT	
GROSS INCOME ($/ha)				$21,425.25
COSTS				
Establishment (Year 1)				$2,003.00
Management (Year 1-10)				$2,816.00
Harvesting	279.35 GMT @	$20.00	/GMT	$5,587.00
Transport (to Ballast Head)	259.80 GMT @	$7.75	/GMT	$2,013.45
Woodchip screening	254.60 GMT @	$1.90	/GMT	$483.74
Woodchip handling & loading	241.88 GMT @	$12.05	/GMT	$2,914.59
TOTAL COSTS ($/ha)				$15,817.78
NET RETURNS ($/ha)				$5,607.47

Source WFR Capital Ltd 2003.

Total transport costs account for 23 per cent of gross income. The cost of transporting woodchips from estate-gate to the Ballast Head is estimated to be $7.75 per GMT (green metric tonne). The cost of handling and loading woodchips from a stockpile at the Ballast Head facility onto barges, which are in turn transferred to ocean carriers is $12.05 per GMT.

The viability of blue gum enterprises and industry growth and development on KI does not rest on the affordability of sea transport across Backstairs Passage utilising existing transport options. In transport terms, industry growth and development depends on the establishment of a bulk commodity loading facility.

Softwood Sector

At the conclusion of planting in 2002, Kangaroo Island had an estimated 4,392 ha of pine plantations *(Pinus radiata)*, which are managed by Treecorp Pty Ltd, Riverleas/S.E.A. Stone and Australian Growth Ltd (Anthea Howard, Kangaroo Island Regional Plantation Committee, pers. comm.). Pines are grown on KI for a range of products including timber for furniture, semi-processed logs, processed posts and sawn timber. Markets for KI pine products are mainland South Australia and inter-state.

In January 2000, a sawmill was established at Timber Creek, near Parndana. While the mill was operational it produced posts, flitches and garden edging from thinnings and these were transported off the island by semi-trailer. The mill is currently being redeveloped, incorporating improved milling technology and further value-adding facilities. It is expected to be operational in the first quarter of 2004.

The future development of the softwood sector is uncertain. In broad terms, the cost of freighting softwood products from KI to Adelaide is currently comparable to freight costs from Mount Gambier to Adelaide, which is approximately double the kilometre distance. If freight was more competitive on the island, there would be greater likelihood of the softwood plantations proceeding to a second rotation. The availability of more competitive freight services would also increase the expected returns on new plantations and improve the opportunities to expand the softwood sector.

3.3 Freight Cost Comparison with Mainland Operators

A freight cost comparison has been made between Kangaroo Island and the mainland, based on discussions with livestock, bulk haulage and general freight carriers (Tables 3.5 and 3.6). It should be noted that freight charges displayed in Tables 3.5 and 3.6 are indicative only. Charges will vary between individual transport operators.

Kangaroo Island's livestock, bulk haulage and general carrier freight costs are higher than mainland costs. For example, the total cost of transporting a truckload of sheep (400 head) from KI to Adelaide (approximately 170km) is $2,000 or $5.00 per head. If a mainland livestock carrier were carting a truckload of sheep over a similar distance, the cost per head would be approximately $1.55 per head (based on a $230 loading fee + $2.30 per kilometre).

The cost of trucking a load of grain (with a superphosphate backload) 170km from KI to Port Adelaide is approximately $30 per tonne. A Murray Bridge-based carrier charges $11 per tonne to deliver from the Murray Bridge region to Port Adelaide (90kms). The mainland carrier would be travelling a distance of approximately 550km (assuming a charge of $1.40 per km for a trailer carrying 26 tonnes) if customers were being charged $30 per tonne.

Several factors contribute to KI's high freight costs in comparison to mainland costs.

Truck operations on Kangaroo Island encounter waiting times for vessels and loads. By industry standards journeys are short and the annual distances over which vehicles operate are very low. On the mainland, operators encounter shorter time delays, journeys are longer, average speeds are high and annual distances are longer.

KI operators therefore charge on a per unit basis (i.e. $/t or $/head), unlike mainland carriers, who generally charge by distance (i.e. cents per km).

More freight is exported from the island than is imported which creates back loading difficulties for transport operators. Historically, about 2.5 times as many empties travel from KI as travel to KI due to the incompatibility of freight and trucks for back loading tasks (QED 1999, p. 30). A lack of back loading leads to further transport inefficiencies, translating into higher transport costs on KI.

Table 3.5 Comparative bulk haulage freight rates: Kangaroo Island and mainland [a]

	Kangaroo Island [b]			Mainland		
Product	Sea Cost	Road Cost	Total Cost	0 - 100km [c]	200km [d e]	400km [d]
Grain ($/t)						
Barge	$32.00	-	$32.00	na	na	na
Truck						
Backload	$17.80	$12.20	$30.00	$11.00	$10.80	$21.60
No backload	na	na	na	$13.50 [f]	$20.00	$40.00
Superphosphate ($/t)						
Backload	$17.80	$9.20	$27.00	$11.00	$10.80	$21.60
No backload	$17.80	$29.20	$47.00	$13.50 [f]	$20.00	$40.00

[a] Freight costs for single trailers (9.1 metres long with 26 tonne capacity).
[b] KI freight costs based on transport between KI and mainland destinations within SA.
[c] Represents approximate distance from the local area (e.g. Murray Bridge) to Port Adelaide.
[d] Based on a rate of $1.40 per km with a back load and $2.60 per km with no back load.
[e] Represents assumed average distance from KI primary producer's farm-gate to Adelaide.
[f] Indicative price ranges from $12.00-$15.00 per tonne.
Source: KI and mainland bulk cartage carriers.

Table 3.6 Comparative livestock freight rates: Kangaroo Island and mainland [a]

	Kangaroo Island [b]			Mainland	
Product	Sea Cost	Road Cost	Total Cost	0 - 200km [c]	400km [d]
Sheep [e] ($/head)					
Adults	$1.60	$3.40	$5.00	$1.75	$2.90
Lambs/Weaners	$1.30	$3.20	$4.50	$1.40	$2.35
Wool [f] ($/bale)	$6.35	$5.65	$12.00	$6.00	$7.00
Cattle [g] ($/head)					
Adults	$16.00	$29.00	$45.00	$17.25	$29.00
Calves/Weaners	$9.75	$20.25	$30.00	$10.65	$17.85

[a] Freight costs for single trailers (12.5 metres long).
[b] KI freight costs based on transport between KI and mainland destinations within SA.
[c] Based on rate of $230 loading fee + $2.30 per km.
[d] Based on rate of $2.90/km for livestock.
[e] Assuming 400 adults or 500 lambs/weaners per load.
[f] Assuming 100 bales per load.
[g] Assuming 40 adults or 65 calves/weaners per load.

Source: KI and mainland livestock and general freight carriers.

KI freight companies are over-capitalised in comparison to their mainland counter-parts. For example, one KI freight transport company representative indicated that they have 5 prime movers and 6 trailers, whereas a mainland company delivering a similar service and travelling similar distances would need only 4 prime movers and 4 trailers. This over-capitalisation occurs for several reasons (QED 1999, p. 19).

- Operators need to have several trailers to enable cartage of a range of different products. Some products are seasonal, therefore trailers specifically designed for these freight tasks are not utilised year-round.
- Trailers and prime movers are kept on both sides of Backstairs Passage.
- SeaLink's schedule, the distance/time of travel time to Adelaide and set delivery times for certain products does not allow all trips to Adelaide to make a return trip on the same day.
- Operators need to have empty trailers ready for loading at the same time as transporting loaded trailers.
- Spares are required.

Most of KI's trucking fleet is relatively old compared with mainland operators. The poor utilisation of equipment and the size of most trucking companies does not provide sufficient funds for regular upgrading of equipment (QED 1999, p. 19). Aging equipment and over-capitalisation leads to further transport inefficiencies and greater costs.

SeaLink charges for freight are considered to be very expensive when taking into account the relatively short distance travelled across Backstairs Passage (14km). SeaLink charges $25.20 per linear metre for freight, which equates to $462.68 return for a 9.1 metre single trailer transporting grain and fertiliser and $635.00 return for a 12.5 metre single trailer transporting livestock. KI transport operators must factor this additional cost into their prices.

QED (1999) conducted a comparison of other ferry services within Australia and New Zealand with SeaLink and found that SeaLink rates for freight and vehicles were generally twice the rates for the short haul services in Queensland and Victoria. For passengers, the SeaLink fares were between 4 to 6 times more expensive than the other services.

4. Assessing the Impact on Key Industries of Reduced Sea Transport Costs

4.1 Primary Industries

4.1.1 Impact of sea freight expenditure

Freight cost outcomes from representative models developed for agricultural and fishing enterprises (see Section 3) were used to estimate aggregate freight expenditures for KI's primary industries (Table 4.1).

Table 4.1 Aggregate freight expenditures for Primary Industries: Kangaroo Island, 2001/02

Enterprise	Sea Freight as a % of gross revenue	Road Freight as a % of gross revenue	Freight as a % of Gross Revenue	Industry Gross Revenue ($)	Sea Freight Expenditure ($)	Road Freight Expenditure ($)	Total Freight Expenditure ($)
Wool & sheep [a]	1.8%	3.3%	5.1%	24,637,254	451,307	802,778	1,254,085
Sheep & wool [b]	2.8%	5.9%	8.7%	19,730,160	558,356	1,160,974	1,719,330
Beef cattle	3.1%	5.6%	8.7%	7,624,172	239,574	426,302	665,876
Other livestock	2.6%	4.9%	7.5%	448,813	11,675	22,043	33,718
Cereals	11.9%	4.2%	16.1%	5,500,021	655,859	229,756	885,615
Other crops	3.0%	1.0%	4.0%	6,357,994	189,542	66,399	255,942
Oil seeds	8.8%	3.1%	11.9%	4,437,375	389,836	137,428	527,265
Rock lobster [c]	0.0%	0.0%	0.0%	4,934,348	0	0	0
Abalone, marine scalefish	0.8%	1.9%	0.8%	2,670,808	20,536	50,686	20,536
Total	**3.3%**	**3.8%**	**7.0%**	**76,340,946**	**2,516,685**	**2,896,367**	**5,362,366**

[a] Freight percentages based on a typical wool producing enterprise with approximately two-thirds of income from wool and one-third from the sale of sheep (see Table 3.2).

[b] Freight percentages based on a typical prime lamb enterprise with approximately 70 per cent of income from the sale of sheep and 30 per cent from wool (see Table 3.2).

[c] Rock lobster fishers receive the same price per kilogram landed as mainland fishers (e.g. Victor Harbor). It is assumed that rock lobster buyers absorb KI-related freight costs.

Source: EconSearch analysis.

Total gross revenue for primary production on KI was estimated to be approximately $76 million for 2001/02. Sea freight expenditure was estimated to represent, on average, 3.3 per cent of total gross revenue. In total, sea freight expenditure by KI's primary industries was estimated to be $2.5 million.

KI's total freight expenditure (sea and road) of $5.4 million represents 7.0 per cent of gross primary industry revenue. This is substantially higher than that estimated for primary industries in Australia as a whole, being 3.4 per cent (ABS 2001)[13].

[13] Total national expenditure by primary industries (excluding mining, forestry and logging) on transport in 1996/97 was $1,012 million, accounting for 3.4 per cent of total gross revenue of $29,993 million (ABS 2001).

4.1.2 Estimated economic impact of reductions in sea freight costs

The impact of reduced sea freight costs (10, 25, 50 75 and 100 per cent reduction) on KI primary industries' profitability is summarised in Table 4.2.

A sea-freight cost reduction is likely to have a greater impact on net returns for KI's cropping industries than net returns for livestock and fishing industries.

A 100 per cent sea freight cost reduction generates minor increases in net returns for livestock industries of 3 per cent for wool, 7 per cent for beef cattle and 8 per cent for prime lambs.

In contrast, a 100 per cent sea freight cost reduction results in a 41 per cent increase in net returns for wheat. The increase in net returns for canola is lower than wheat because canola is a product that is higher in value than wheat. The increase in net returns for oats from a 100 per cent sea freight cost reduction is smaller than both wheat and canola because a significant proportion of the oats produced on KI is not transported off the island.

A 100 per cent sea freight cost reduction generates only a 1 per cent increase in net returns for the marine scalefish industry.

Table 4.2 Impact of sea freight cost reduction on Primary Industries' profitability: Kangaroo Island [a]

Primary industry measure of profitability [b]	Net Returns for Varying Levels of Sea Freight Cost Reduction						Increase in net returns with 100% reduction
	0%	10%	25%	50%	75%	100%	
Wool Gross Margin [c] ($/ha)	301	302	303	306	308	311	3%
Prime Lambs Gross Margin ($/ha)	218	220	222	227	231	235	8%
Beef Cattle Gross Margin ($/ha)	95	95	96	98	100	102	7%
Wheat Gross Margin ($/ha)	260	271	287	313	340	367	41%
Canola Gross Margin ($/ha)	321	327	336	351	366	380	19%
Oats Gross Margin ($/ha)	279	282	286	294	301	309	11%
Marine Scalefish Cash OS [d] ($'000)	30.2	30.2	30.3	30.4	30.5	30.6	1%
Rock Lobster Cash OS ($'000)	88.8	88.8	88.8	88.8	88.8	88.8	0%

[a] These results were derived on the basis of estimated costs and returns at the time of compiling the report. Changes in input costs and product prices could substantially alter the estimated impact of sea freight cost reductions.
[b] Details of industry profitability can be found in Section 3 and Appendix 2.
[c] Gross margin is the difference between gross income and variable costs of an enterprise.
[d] Cash operating surplus is the difference between gross income and total cash costs.

Source: EconSearch analysis.

4.2 Tourism

4.2.1 Estimated Elasticities

Transport costs are significant in the context of tourism on the island. The key issue for this analysis is the sensitivity of travel patterns with respect to transfer costs. In economic terms this is described as the elasticity of demand for an activity, which measures the proportional change in quantity demanded of an activity or product for a proportional change in cost.

There is very limited research on which to base assumptions about elasticity for travel to Kangaroo Island. The analysis assumes that demand elasticities are as follows:

- -2 for international tourism (i.e. it is assumed that a 1 per cent decrease in total travel costs would produce a 2 per cent increase in visitor numbers).

  This estimate is similar to estimates from a range of studies[14] for total international tourism to Australia. The above estimate can only be considered indicative as the cited studies relate to tourism overall. Furthermore, specific items within a trip could in some cases be more sensitive (more options) and in others less sensitive to changes in travel costs (i.e. it is a much smaller proportion of the overall holiday or visit cost).
- -3 for interstate tourism.

  It is generally assumed that an interstate visitor has more choices for a substitute tourism type product (eg nature based tourism in their own city etc) so a higher elasticity is assumed.
- -5 for local tourism (intrastate).

  An even greater number of substitute activities are assumed to be available to locals for tourist activities.

4.2.2 Impact on Visitor Numbers

The base scenario for analysis is assumed to be a 10 per cent decline in travel costs to KI, proportional to existing expenditure. This is a very simple way to consider the issue, in that there is a range of possible responses.

- Visitors may rearrange their travel patterns (i.e. choosing lower cost options e.g. sea ferry instead of air).
- Travel cost is not the only factor to be considered. Quality of service needs to be considered. A lowering of costs as a consequence of reduced service would not be equivalent to cost reduction from other sources.

[14] CoPS/IMPACT Working Paper Number G-131: The Government's Tax Package: Further Analysis based on the MONASH Model. “However it is not clear what elasticity value should be used in translating foreign-currency price increases into resulting reductions in tourist and student numbers. In the central simulation we assumed that foreign elasticities of demand for these services are –3”.

Barry Burgan , Research Report: Selected Issues in the Economic Contribution of Tourism in South Australia, 5th April 2001 “A significant issue for the tourism industry is that it is acknowledged as a product with high price sensitivity. The literature suggests that it has an own price elasticity of significantly greater than 1, and indeed there are range of studies that suggest the appropriate estimate of elasticity is of the order of 2”. These are demand elasticities – and therefore in a negative context.

Department of Industry Science and Tourism, submission to the Industry Commission Inquiry into International Air Services, March 1998, suggests that international visits to Australia have an elasticity of around –2.

- Visitors may choose to reallocate expenditure between items (i.e. spending less on travel may induce increased expenditure on entertainment options) or change their length of stay. These responses are not modelled.

Based on the visitor numbers in 2001, applying the above elasticities and further assuming that it applies to the proportion of total expenditure change, Tables 4.3 and 4.4 indicate the estimated increase in visitor numbers and nights resulting from a 10 per cent decrease in transport costs.

Table 4.3 Estimated increase in tourism outcomes based on 10 per cent decline in average sea transport costs

Visitor Group	Day Trips	Overnight Visits	Nights	Average Nights per Visit
International	833	2,041	4,490	2.2
Interstate	569	2,408	10,981	4.56
Intrastate	571	5,262	24,467	4.65
Total	1,973	9,711	39,939	Na

Source: Economic Research Consultants analysis.

Table 4.4 indicates these numbers as a proportion of the underlying 2001 base, suggesting that day-trips increase by 14 per cent while over-night trips increase by 8 per cent.

Table 4.4 Estimated proportional increase in tourism outcomes based on 10 per cent decline in average sea transport costs

Visitor Numbers	Day Trips	Overnight Visitors	Nights
International	12%	6%	6%
Interstate	14%	7%	7%
Intrastate	17%	10%	10%
Average	14%	8%	8%

Source: Economic Research Consultants analysis.

4.2.3 Estimated Economic Impact of Increased Visitor Numbers

Based on this change in number of visitors and using the same analytical framework for assessment as in the above, it was estimated that visitor expenditures associated with tourism to Kangaroo Island would increase by $2.3 million (4.3 per cent increase over the base) from a 10 per cent sea transport cost reduction and up to $21.2 million from a 100 per cent reduction (Table 4.5).

Table 4.5 Change in visitor expenditure for varying levels of passenger sea transport cost reduction – KI ($m)

	Sea transport cost reduction					
Visitor Group	0%	10%	25%	50%	75%	100%
International	-	0.7	1.7	3.3	4.8	6.2
Interstate	-	0.4	1.1	2.2	3.2	4.1
Intrastate	-	1.2	2.9	5.6	8.3	10.8
Total	-	2.3	5.7	11.1	16.3	21.2

Source: Economic Research Consultants analysis.

In addition to the expenditure on KI, visitor expenditures associated with tourism to Kangaroo Island will also involve expenditure on goods and services elsewhere in South Australia. The change in visitor expenditure in South Australia for varying levels of passenger sea transport cost reduction is shown in Table 4.6.

Table 4.6 Change in visitor expenditure for varying levels of passenger sea transport cost reduction – SA ($m)

	Sea transport cost reduction					
Visitor Group	0%	10%	25%	50%	75%	100%
International	-	0.8	1.9	3.6	5.2	6.7
Interstate	-	0.5	1.3	2.4	3.5	4.6
Intrastate	-	1.4	3.4	6.6	9.5	12.2
Total	-	2.7	6.5	12.6	18.3	23.5

Source: Economic Research Consultants analysis.

5. Economic Impacts of Reduced Sea Transport Costs

The economic impacts on the Kangaroo Island economy from reduced sea freight and passenger transport costs were estimated using a regional input-output model for Kangaroo Island developed by EconSearch for this study. The economic impacts on the South Australian economy were estimated using a state economic model developed previously by EconSearch (2001).

5.1 Kangaroo Island

As detailed in Table 4.1, aggregate sea freight expenditure in the primary industries (agriculture and fishing) was estimated to total approximately $2.5 million in 2001/02. Sea freight cost reductions brought about by subsidies (or other means) will result in direct savings to primary producers. Savings for various rates of cost reduction are shown in the first row of Table 5.1.

The analysis in the previous section showed that visitor expenditures associated with tourism on Kangaroo Island would increase in response to a sea transport cost reduction. The change in expenditure in response to various rates of reduction are shown in the second row of Table 5.1.

Table 5.1 Direct impact on primary industries and tourism of sea transport cost reduction – KI ($m)

	Sea transport cost reduction					
	0%	10%	25%	50%	75%	100%
Primary industries sea freight savings	-	0.3	0.6	1.3	1.9	2.5
Increase in visitor expenditure on KI	-	2.3	5.7	11.1	16.3	21.2

Source: EconSearch analysis.

Freight cost reductions will increase net returns of individual primary production enterprises which will, in turn, lead to increases in operating surpluses and disposable income. Increased spending by households involved in primary production will generate additional economic activity and flow-ons in the KI economy. The following observations are made regarding the primary industry related impacts presented in Table 5.2.

- Impacts increase in line with the reduction in sea freight costs.
- The impacts are relatively small. It was estimated a 100 per cent freight cost reduction would generate just 12 additional jobs. This represents 0.6 per cent of total employment on KI (assuming total employment of approximately 1,880 fte).
- Value added impacts are also small. A 100 per cent freight cost reduction would add only 0.8 per cent to gross regional product.

Table 5.2 Total economic impact of sea transport cost reduction - KI

	Sea transport cost reduction					
	0%	10%	25%	50%	75%	100%
Value Added ($m)						
Primary Industries related impact	-	0.1	0.3	0.5	0.8	1.1
Tourism related impact	-	2.7	6.7	13.1	19.1	24.8
Total impact	*-*	*2.8*	*7.0*	*13.6*	*19.9*	*25.8*
Household Income ($m)						
Primary Industries related impact	-	0.0	0.1	0.2	0.3	0.4
Tourism related impact	-	1.0	2.5	4.8	7.1	9.3
Total impact	*-*	*1.0*	*2.6*	*5.0*	*7.4*	*9.7*
Employment (no. of jobs)						
Primary Industries related impact	-	1	3	6	9	12
Tourism related impact	-	35	87	171	253	333
Total impact	*-*	*36*	*90*	*177*	*262*	*346*

Source: EconSearch analysis.

The estimated economic impacts from increased visitor expenditure in tourism are also presented in Table 5.2. Increases in visitor numbers and visitor expenditure will generate additional economic activity in the tourism sectors (accommodation, transport, trade, recreation, etc.) and flow-ons in other sectors of the KI economy.

Clearly, the tourism impacts are much larger than the primary industries related effects. For example, a 10 per cent reduction in sea transport costs will generate, in total, an additional $2.8 million in value added (gross regional product), of which $2.7 million would be generated by increased tourist expenditures and the balance from additional household expenditure by primary producers.

For high rates of cost reduction, the impacts on the Kangaroo Island economy become significant. The total impact (tourism and primary industries related) of a 100 per cent sea transport cost reduction, for example, would add 19 per cent to gross regional product ($25.8 million), 16 per cent to household income on the Island ($9.7 million) and 18 per cent to employment (346 jobs). An employment increase of this magnitude could increase KI's population by more than 800[15].

Although the primary industries related impact of reduced freight costs are estimated to be small, there are likely to be other, more difficult to quantify but potentially larger impacts occurring. In addition to the increases in disposable income that would arise from freight savings, there could, over time, be significant enterprise substitution. This might result in a change in the mix of commodities being produced on KI and, in that way, have a more significant impact than the simple income effect. In general terms,

[15] This assumes that all new employment would be sourced from off the island (not unreasonable given that the current unemployment rate is around 3.6 per cent) and that population would increase in line with the current population/ fte employment ratio of around 2.3.

there is likely to be a substitution of cropping for livestock. The extent to which this would occur, however, is difficult to estimate for several reasons.

- Relative prices are volatile.
- The shift towards cropping in recent years has already occurred.
- Recent and possible future expansion of forestry on KI, utilising land that is also suitable for cropping.
- The ease of substitution between cropping and livestock now is reduced compared to, say, five years ago when there was more suitable cropping land available.
- Consistent with the above, the recent *Kangaroo Island Primary Producers Audit* (Truscott Research 2002) revealed that there is not expected to be a significant increase in cropping area in the next five years.

Besides savings to primary producers and increases in visitor expenditure on KI, a significant reduction in sea freight and passenger transport costs (i.e. 50 – 100 per cent) could generate other impacts that have not been quantified in this study. Examples of other potential impacts are as follows.

- The psychology of investors could be affected in a positive way with significant reductions in sea access costs, resulting in increased confidence to invest in businesses on KI.
- KI may become a more attractive retirement destination with increased retiree numbers boosting the island's population and demand for housing, health and recreational services.
- A number of KI food and wine products are currently processed off the island. These products are sold predominantly in mainland markets due to the high cost of transporting these products back to KI. Reduced freight costs would provide increased opportunity to bring processed products back to the island for sale to residents and visitors.

If these unquantified benefits are relevant, then the estimates generated for this study could be significantly understated.

5.2 South Australia

Sea freight cost reductions will result in direct savings to primary producers on Kangaroo Island. Savings for various rates of cost reduction are shown in the first row of Table 5.3. These savings are unchanged from the corresponding figures in Table 5.1.

The analysis in Section 4 (Table 4.6) showed that visitor expenditures associated with tourism on Kangaroo Island would increase in response to a sea transport cost reduction. The change in expenditure at the state level in response to various rates of cost reduction are shown in the second row of Table 5.3.

Table 5.3 Direct impact on primary industries and tourism of sea transport cost reduction – SA ($m)

	Sea transport cost reduction					
	0%	10%	25%	50%	75%	100%
Primary industries sea freight savings	-	0.3	0.6	1.3	1.9	2.5
Increase in visitor expenditure in SA	-	2.7	6.5	12.6	18.3	23.5

Source: EconSearch analysis.

Increased spending by households involved in primary production (assumed to equal freight savings estimated in Table 5.3) will generate additional economic activity and flow-ons in the state economy. These impacts are estimated to be slightly larger than the impacts on Kangaroo Island as part of the increased spending will occur off the island, elsewhere in South Australia. The primary industries related impacts are presented in Table 5.4.

The estimated economic impacts from increased visitor expenditure in tourism are also presented in Table 5.4. Increases in visitor numbers and visitor expenditure will generate additional economic activity in the tourism sectors (accommodation, transport, trade, recreation, etc.) and flow-ons in other sectors of the state economy.

A 100 per cent sea freight and passenger transport costs would, in total, add $26 million to State's economy and generate over 400 jobs. These positive impacts need to be considered in light of the costs that would be involved in providing the reduced or zero cost sea transport service.

Table 5.4 Total impact on SA economy of sea transport cost reduction

	Sea transport cost reduction					
	0%	10%	25%	50%	75%	100%
Value Added ($m)						
Primary Industries related impact	-	0.2	0.4	0.8	1.2	1.6
Tourism related impact	-	2.7	6.7	13.1	19.1	24.8
Total impact	-	*2.9*	*7.1*	*13.9*	*20.4*	*26.4*
Household Income ($m)						
Primary Industries related impact	-	0.1	0.2	0.3	0.5	0.6
Tourism related impact	-	1.3	3.3	6.5	9.5	12.4
Total impact	-	*1.4*	*3.5*	*6.8*	*10.0*	*13.0*
Employment (no. of jobs)						
Primary Industries related impact	-	2	4	9	13	17
Tourism related impact	-	41	102	200	296	389
Total impact	-	*43*	*106*	*209*	*309*	*407*

Source: EconSearch analysis.

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Appendix 1 The GRIT Procedure

Step	Action
	PHASE I Adjustments to National Table
1	Selection of national input-output table. (106-sector table with direct allocation of all imports, in basic values).
2	Adjustment of national table for updating.
3	Adjustment for international trade.
	PHASE II Adjustments for Regional Imports
4	Calculation of "non-existent" sectors.
5	Calculation of remaining imports.
	PHASE III Definition of Regional Sectors
6	Insertion of disaggregated superior data.
7	Aggregation of sectors.
8	Insertion of aggregated superior data.
	PHASE IV Derivation of Prototype Transactions Tables
9	Derivation of transactions values.
10	Adjustments to complete the prototype tables.
11	Derivation of inverses and multipliers for prototype tables.
	PHASE V Derivation of Final Transactions Tables
12	Final superior data insertions and other adjustments.
13	Derivation of final transactions tables.
14	Derivation of inverses and multipliers for final tables.

Source: Table 2 in Bayne and West (1988)

Appendix 2 Glossary of Input-Output Terminology

Consumption-induced effects are additional output, employment and income resulting from re-spending by households that receive income from employment in direct and indirect activities. Consumption-induced effects are sometimes referred to as "induced effects".

Direct effects are the initial round of output, employment and income generated by an economic activity.

Employment is the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalent jobs.

Flow-on effects are the sum of the production-induced effects and the consumption-induced effects.

Gross regional (or State) product is a measure of value added on a regional basis. It can be calculated using two methods. The income method calculates GRP as household income plus other value added. The expenditure method calculates GRP as household expenditure plus other final demand, that is, in total, gross regional expenditure, plus exports less imports.

Household income is wages and salaries and other payments to labour including overtime payments and income tax, but excluding payroll tax.

Input-output analysis is an accounting system of inter-industry transactions based on the notion that no industry exists in isolation.

Input-output table is a transactions table that illustrates and quantifies the purchases and sales of goods and services taking place in an economy at a given point in time. It provides a numerical picture of the size and shape of the economy and its essential features. Each item is shown as a purchase by one sector and a sale by another, thus constructing two sides of a double accounting schedule.

Multiplier is an index (ratio) indicating the overall change in the level of activity that results from an initial change in economic activity. They are an indication of the strength of the linkages between a particular sector and the rest of the regional economy. They can be used to estimate the impact of a change in that particular sector on the rest of the economy.

Other Final Demand includes recurrent government expenditure, private and public sector investment (gross fixed capital formation) and change in stocks (inventories).

Other Value Added includes gross operating surplus and all taxes, less subsidies.

Output is gross revenue of goods and services produced by commercial organisations plus gross expenditure by government agencies.

Production-induced effects are additional output, employment and income resulting from re-spending by firms that receive income from the sale of goods and services to firms undertaking, for example, agricultural activities. Production-induced effects are sometimes referred to as "indirect effects".

Total impact is the sum of the direct effects and the flow-on effects.

Type I multiplier is calculated as (direct effects + production induced effects)/direct effects.

Type II multiplier is calculated as (direct effects + production induced effects + consumption induced effects)/direct effects.

Value added is calculated as the value of output less the cost of goods and services (including imports) used in producing the output. It represents payments to the primary inputs of production (labour, capital and land). Value added is consistent with standard measures of economic activity, such as gross domestic, State or regional product and it provides an assessment of the net contribution to regional economic growth of a particular enterprise or activity.

Appendix 3 Representative Primary Industry Enterprise Models

Table A3.1 Gross margins model for a representative self-replacing merino flock enterprise, Kangaroo Island (2002/03)

Enterprise Type:	SELF REPLACING MERINO FLOCK		
Region:	Kangaroo Island		
ASSUMPTIONS			
Total DSE's	2000	Total area	167 ha
Stocking rate (DSE/Ha)	12.0	*Feed Consumption*	
Average fibre diameter (microns)	21.5	Oats/barley	28 kg/ewe
Number of breeding ewes	833	Hay	20 kg/ewe
Average weaning rate	85%	Lupins	10 kg/weaner

INCOME	Quantity	Unit	Price/Unit	Unit Price	Income/ha	Total/ha
Wool (kg greasy)	8,833	kg @	680	c/kg	$60,064	
Sheep sales	682	head @	$44.22	/head	$30,158	$90,222
GROSS INCOME						$90,222

VARIABLE COSTS	Quantity	Unit	Price	Unit Price	Cost/ha	Total/ha
SHEARING						
Shearing	2,218	sheep @	$184.69	/ 100 hd	$4,096	
	20	rams @	$369.38	/ 100 hd	$74	
Shed labour	7	days @	$136.72	/day	$957	
Wool classer	2,238	sheep @	$194.85	/ 1000 hd	$436	
Superannuation (on ord. wages)			9%	wages	$501	
Work Cover (wages + super)			5.0%	total	$303	
Wool packs	60	packs @	$9.00	/pack	$540	
Shed sundries	2238	sheep @	$0.20	/sheep	$448	
Backlining	2238	sheep @	$0.35	/sheep	$783	
Crutching & wigging	1561	sheep @	$53.56	/100 hd	$836	
	30	rams @	$53.36	/100 hd	$16	$8,990
ANIMAL HEALTH						
Drench	2269	sheep @	$1.00	/head	$2,269	
Vaccinate	2269	sheep @	$0.24	/head	$545	
Blowfly treatment	2269	sheep @	$0.08	/head	$182	$2,996
SALE AND PURCHASE COSTS						
Purchases	6	rams @	$550.00	/head	$3,300	
Freight - Stock [a]						
Road	682	sheep @	$3.40	/head	$2,319	
Sea	682	sheep @	$1.60	/head	$1,091	
- Wool [b]						
Road	60	bales @	$6.35	/bale	$381	
Sea	60	bales @	$5.65	/bale	$339	
- Superphosphate [c]						
Road	12.5	tonnes @	$19.20	/tonne	$240	
Sea	12.5	tonnes @	$17.80	/tonne	$223	
Comission (on sales)	$30,158	gross sales @	5.5%	gross sales	$1,659	
Yard fees	682	head @	$0.35	/head	$239	
Transaction levy	682	head @	$0.40	/head	$273	$10,063
FEED						
Oats/barley	833	ewes @	$250.00	/tonne	$5,831	
Hay	833	ewes @	$120.00	/tonne	$1,999	
Lupins	708	ewes @	$320.00	/tonne	$2,266	$10,096
OTHER						
Superphosphate	12.5	tonnes @	$415.00	/tonne	$5,188	
Aerial spraying	167	ha @	$3.50	/ha	$585	
Insurance	$69,283	value @	$2.50	/$1,000	$173	
Water	1,982	DSE @	$0.50	/DSE	$991	
Fuel	1,982	DSE @	$0.25	/DSE	$496	
Other	1,982	DSE @	$0.25	/DSE	$496	$7,927
TOTAL VARIABLE COSTS						$40,071
GROSS MARGIN TOTAL						**$50,151**
GROSS MARGIN / HA						**$301**
GROSS MARING / DSE						**$25**

[a] Total freight cost of $5.00 per head for adult sheep.

[b] Total freight cost of $12 per bale of wool.

[c] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.2 Gross margins model for a representative prime lamb enterprise, Kangaroo Island (2002/03)

Enterprise Type:	PRIME LAMBS			
Region:	Kangaroo Island			
ASSUMPTIONS				
Total DSE's	1840		Total area	184 ha
Stocking rate (DSE/Ha)	10.0		Weaning %	85%
Average fibre diameter (microns) - ewes	22.5		Age ewes bt	4.5 years
Number of breeding ewes	1000		Age ewes c[…]	6.5 years

INCOME	Quantity	Unit	Price/Unit	Unit Price	Income/ha	Total/ha
Wool (kg greasy)						
Ewes (960 ewes @ 5.5 kg /head)	5,280	kg @	680	c/kg	$35,904	
Rams (19 rams @ 3.00 kg /head)	57	kg @	441	c/kg	$251	$36,155
Sheep sales	1,326	head @	$56.65	/head	$75,118	$75,118
GROSS INCOME						$111,273

VARIABLE COSTS	Quantity	Unit	Price	Unit Price	Cost/ha	Total/ha
SHEARING						
Shearing	980	sheep @	$184.69	/ 100 hd	$1,810	
	19	rams @	$369.38	/ 100 hd	$70	
Shed labour	4	days @	$136.72	/day	$547	
Wool classer	2.5	days @	$194.85	/ day	$487	
Superannuation (on ord. wages)			9%	wages	$262	
Work Cover (wages + super)			5.0%	total	$159	
Wool packs	33	packs @	$9.00	/pack	$297	
Shed sundries	979	sheep @	$0.20	/sheep	$196	
Backlining	979	sheep @	$0.35	/sheep	$343	
Crutching & wigging	850	lambs @	$53.56	/100 hd	$455	
	979	adults @	$53.36	/100 hd	$522	$5,148
ANIMAL HEALTH						
Drench	1870	sheep @	$1.00	/head	$1,870	
Vaccinate	1870	sheep @	$0.24	/head	$449	
Blowfly treatment	1870	sheep @	$0.08	/head	$150	$2,468
SALE AND PURCHASE COSTS						
Purchases	7	rams @	$500.00	/head	$3,500	
	510	ewes @	$50.00	/head	$25,500	
Freight - Sheep [a]						
Road	993	sheep @	$3.40	/head	$3,376	
Sea	993	sheep @	$1.60	/head	$1,589	
- Lambs [b]						
Road	850	prime lambs @	$3.20	/head	$2,720	
Sea	850	prime lambs @	$1.30	/head	$1,105	
- Wool [c]						
Road	33	bales @	$5.65	/bale	$186	
Sea	33	bales @	$6.35	/bale	$210	
- Fertiliser [d]						
Road	13.8	tonnes @	$19.20	/tonne	$265	
Sea	13.8	tonnes @	$17.80	/tonne	$246	
Comission (on sales)	$75,118	gross sales @	5.5%	gross sales	$4,131	
Yard fees	1,426	head @	$0.35	/head	$499	
Transaction levy - sheep	476	head @	$0.40	/head	$190	
- lambs	850	head @	$0.90	/head	$765	$44,283
FEED						
Hay	20	tonnes @	$120.00	/tonne	$2,400	
Grain	36	tonnes @	$250.00	/tonne	$9,000	$11,400
OTHER						
Superphosphate	13.8	tonnes @	$415.00	/tonne	$5,727	
Aerial spraying	184	ha @	$3.50	/ha	$644	
Insurance	$40,000	value @	$2.50	/$1,000	$100	
Water	1,840	DSE @	$0.50	/DSE	$920	
Fuel	1,840	DSE @	$0.25	/DSE	$460	$7,851
TOTAL VARIABLE COSTS						$71,150
GROSS MARGIN TOTAL						**$40,123**
GROSS MARGIN / HA						**$218**
GROSS MARING / DSE						**$22**

[a] Total freight cost of $5.00 per head for adult sheep.

[b] Total freight cost of $4.50 per head for lambs.

[c] Total freight cost of $12.00 per bale of wool.

[d] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.3 Gross margins model for a representative beef enterprise, Kangaroo Island (2002/03)

Enterprise Type:	BEEF	(Grass fattened)						
Region:	Kangaroo Island							
ASSUMPTIONS								
Cow breeding herd	100	head		Feed - Hay	35	kg/DSE		
Herd DSE	1091	DSE						
Area	109	ha						
Stocking rate	10	DSE/ha						
Breeding cow DSE equivalent	15	DSE						
INCOME	Number	Unit	Weight	Unit	Price/Unit	Unit Price	Income/ha	Total/ha
Stock sales								
Vealers	54	head @	170	kg/carcass @	$2.60	/kg HSCW	$23,868	
Yearlings	22	head @	220	kg/carcass @	$2.50	/kg HSCW	$12,100	
Cull cows	10	head @	270	kg/carcass @	$1.90	/kg HSCW	$5,130	
Cull bulls	1	head @			$900.00	/head	$900	$41,998
GROSS INCOME								$41,998
VARIABLE COSTS			Quantity	Unit	Price	Unit Price	Cost/ha	Total/ha
STOCK PURCHASES								
Bulls			1	head @	$2,500.00	/head	$2,500	$2,500
ANIMAL HEALTH								
Drench (Cows 2x, Calves 1x)			290	head @	$4.88	/head	$1,415	
Ear tags - NLIS			90	tags @	$3.60	/tag	$324	
Tail tags			87	tags @	$0.37	/tag	$32	
Vaccine			180	doses @	$0.28	/dose	$60	$1,822
SALE AND PURCHASE COSTS								
Freight								
Livestock - Adults [a]								
Road			34	head @	$29.00	/head	$986	
Sea			34	head @	$16.00	/head	$544	
- Calves & Weaners [b]								
Road			54	calves @	$20.25	/head	$1,094	
Sea			54	calves @	$9.75	/head	$527	
- Superphosphate [c]								
Road			14	tonnes @	$19.20	/tonne	$269	
Sea			14	tonnes @	$17.80	/tonne	$249	
Comission (on sales)			$41,998	gross sales @	5.0%	gross sales	$2,100	
Transaction levy			87	head @	$3.50	/head	$305	$6,072
FEED								
Hay			66	tonnes @	$120.00	/tonne	$7,920	$7,920
FERTILISER								
Superphosphate			14	tonnes @	$415.00	/tonne	$5,810	$5,810
TOTAL VARIABLE COSTS								$24,124
GROSS MARGIN TOTAL								**$17,874**
GROSS MARGIN / HA								**$95**
GROSS MARGIN / COW								**$179**
GROSS MARING / DSE								**$9**

[a] Total freight cost of $45.00 per head for adult cattle.

[b] Total freight cost of $30.00 per head for calves and weaners.

[c] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.4 Gross margins model for a representative wheat enterprise, Kangaroo Island (2002/03)

Enterprise Type:	WHEAT (APW)					
Region:	Kangaroo Island					
INCOME	Yield	Unit/ha	Price/unit	Unit	Income/ha	Total/ha
Wheat (APW)	3.2	t/ha @	$190.00	/t	$608.00	$608.00
GROSS INCOME						$608.00
VARIABLE COSTS	Application Rate	Unit/ha	Price/unit	Unit	Cost/ha	Total/ha
SEED & TREATMENTS						
Seed	100	kg/ha @	$0.24	/kg	$24.00	
Seed Treatments	100	kg/ha @	$0.05	/kg	$5.00	$29.00
FERTILISERS						
Super M 18	120	kg/ha @	$430.00	/t	$51.60	
Urea	120	kg/ha @	$370.00	/t	$44.40	$96.00
CHEMICALS						
Diuron	0.6	litres/ha @	$15.00	/litre	$9.00	
Ally 600g/kg	5	grams/ha @	$0.38	/gram	$1.90	
Roundup Super Max 540g/L	1.5	litre/ha @	$7.00	/litre	$10.50	
Stomp 330g/L	1.3	litres/ha @	$9.00	/litre	$11.70	
Fastac	0.25	units/ha @	$23.70	/unit	$5.93	$39.03
OPERATIONS						
Fuel & Oil					$16.00	
Repairs & Maintenance					$16.81	$32.81
FREIGHT						
Grain						
Road [a]	3.2	tonnes/ha @	$9.00	/tonne	$28.80	
Sea [b]	3.2	tonnes/ha @	$32.00	/tonne	$102.40	
Fertiliser [c]						
Road	0.24	tonnes/ha @	$19.20	/tonne	$4.61	
Sea	0.24	tonnes/ha @	$17.80	/tonne	$4.27	$140.08
INSURANCE & LEVIES						
Insurance	$608.00	gross income/ha @	$8.35	/$1,000	$5.08	
Levies			$6.05	/ha	$6.05	$11.13
TOTAL PRODUCTION COSTS						$348.04
GROSS MARGIN ($/ha)						**$259.96**

[a] Grain is transported from farm-gate to Kingscote by road.

[b] Assume grain is transported from Kingwscote to Port Adelaide by barge.

[c] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.5 Gross margins model for a representative canola enterprise, Kangaroo Island (2002/03)

Enterprise Type:	CANOLA					
Region:	Kangaroo Island					
INCOME	Yield	Unit/ha	Price/unit	Unit	Income/ha	Total/ha
Oats (Milling)	1.7	t/ha @	$400.00	/t	$680.00	$680.00
GROSS INCOME						$680.00
VARIABLE COSTS	Application Rate	Unit/ha	Price/unit	Unit	Cost/ha	Total/ha
SEED & TREATMENTS						
Seed	4	kg/ha @	$4.00	/kg	$16.00	$16.00
FERTILISERS						
Super M 18	100	kg/ha @	$400.00	/tonne	$40.00	
Urea	200	kg/ha @	$375.00	/tonne	$75.00	$115.00
CHEMICALS						
Roundup P Max	1.2	litre/ha @	$6.80	/litre	$8.16	
Goal CT	0.1	units/ha @	$33.00	/unit	$3.30	
Sprayseed	0.6	units/ha @	$8.00	/unit	$4.80	
Simazine	1.2	litre/ha @	$8.90	/litre	$10.68	
Talstar	0.08	litre/ha @	$78.00	/litre	$6.24	
Imidan	0.25	litre/ha @	$8.00	/litre	$2.00	
Fastac	0.2	units/ha @	$33.00	/litre	$6.60	$41.78
OPERATIONS						
Fuel & Oil					$20.00	
Repairs & Maintenance					$24.00	$44.00
FREIGHT						
Grain						
Road [a]	1.7	tonnes/ha @	$9.00	/tonne	$15.30	
Sea [b]	1.7	tonnes/ha @	$32.00	/tonne	$54.40	
Fertiliser [c]						
Road	0.3	tonnes/ha @	$19.20	/tonne	$5.76	
Sea	0.3	tonnes/ha @	$17.80	/tonne	$5.34	$80.80
INSURANCE & LEVIES						
Insurance	$680.00	gross income/ha @	$14.00	/$1,000	$9.52	
Levies			$7.20	/ha	$7.20	$16.72
CONTRACT WORK						
Aerial spraying			$10.00	/ha	$10.00	
Windrowing			$35.00	/ha	$35.00	$45.00
TOTAL PRODUCTION COSTS						$359.30
GROSS MARGIN ($/ha)						**$320.70**

[a] Grain is transported from farm-gate to Kingscote by road.

[b] Assume grain is transported from Kingwscote to Port Adelaide by barge.

[c] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.6 Gross margins model for a representative oats enterprise, Kangaroo Island (2002/03)

Enterprise Type:	OATS (Milling)					
Region:	Kangaroo Island					
INCOME	Yield	Unit/ha	Price/unit	Unit	Income/ha	Total/ha
Oats (Milling)	3.2	t/ha @	$150.00	/t	$480	$480
GROSS INCOME						$480
VARIABLE COSTS	Application Rate	Unit/ha	Price/unit	Unit	Cost/ha	Total/ha
SEED & TREATMENTS						
Seed	80	kg/ha @	$0.27	/kg	$21.60	
Seed Treatments	80	kg/ha @	$0.02	/kg	$1.60	$23.20
FERTILISERS						
10:20:0	100	kg/ha @	$440.00	/t	$44.00	
Urea	120	kg/ha @	$350.00	/t	$42.00	$86.00
CHEMICALS						
Glyphosphate CT	1	litre/ha @	$7.50	/litre	$7.50	
Chlorsulfuron	20	gram/ha @	$0.22	/gram	$4.40	$11.90
OPERATIONS						
Fuel & Oil					$11.90	
Repairs & Maintenance					$16.37	$28.27
FREIGHT						
Grain [a]						
Road [b]	1.1	tonnes/ha @	$9.00	/tonne	$10.08	
Sea [c]	0.8	tonnes/ha @	$32.00	/tonne	$26.88	
Fertiliser [d]						
Road	0.19	tonnes/ha @	$19.20	/tonne	$3.65	
Sea	0.19	tonnes/ha @	$17.80	/tonne	$3.38	$43.99
INSURANCE & LEVIES						
Insurance	$480.00	gross income/ha @	$8.35	/$1,000	$4.01	
Levies			$4.02	/ha	$4.02	$8.03
TOTAL PRODUCTION COSTS						$201.39
GROSS MARGIN ($/ha)						**$278.61**

[a] Assume 65% of oats produced are retained on farm and 35% are sold (25% to other KI farms, 75% off island).

[b] Grain is transported between farm-gate and Kingscote by road.

[c] Assume grain is transported from Kingescote to Port Adelaide by barge run by Ausbulk.

[d] Total average freight cost of $37.00 per tonne of superphosphate ($27.00 per tonne with backload, $47.00 per tonne without backload).

Source: Rural Solutions SA (2003) and KI industry representatives (pers. comm.).

Table A3.7 Costs and returns for a representative rock lobster enterprise, Kangaroo Island (2002/03)

Enterprise Type:	ROCK LOBSTER
Region:	Kangaroo Island
INCOME	
Estimated catch (kg)	10,000
Average price ($/kg)	32.00
GROSS INCOME	$320,000
VARIABLE COSTS ($)	
Fuel	41,000
Bait and tackle	13,000
Provisions	4,000
Labour	80,000
Freight	0
Total	138,000
FIXED COSTS ($)	
Repairs and maintenance	17,000
Licence fee	11,000
Insurance	9,000
Interest	33,000
Legal, accounting	5,000
Telephone, fax, etc	3,000
Office, admin, etc	4,000
Travel	3,200
Slip & Mooring	3,000
Leasing	2,000
Other	3,000
	93,200
TOTAL COSTS ($)	$231,200
CASH OPERATING SURPLUS	$88,800

[a] Excludes unpaid labour

Source: EconSearch (2003a) and KI industry representatives (pers. comm.).

Table A3.8 Costs and returns for a representative marine scalefish enterprise, Kangaroo Island (2002/03)

Enterprise Type:	MARINE SCALEFISH
Region:	Kangaroo Island
INCOME	
Estimated catch (kg)	4,500
Average price ($/kg)	12.50
GROSS INCOME ($)	$56,250
VARIABLE COSTS ($)	
Fuel	5,800
Bait	1,700
Tackle/Provisions	1,200
Labour	0
Freight	
Road	1,068
Sea	433
Total freight	1,500
Total	10,200
FIXED COSTS ($)	
Repairs and maintenance	4,400
Licence fee	3,600
Insurance	1,800
Interest	300
Legal, accounting	500
Telephone, fax, etc	600
Office, admin, etc	1,600
Travel	2,000
Slip & Mooring	300
Other	800
Total	15,900
TOTAL COSTS ($)	$26,100
CASH OPERATING SURPLUS [a]	$30,150

[a] Excludes unpaid labour

Source: EconSearch (2003b) and KI industry representatives (pers. comm.).