

ECONOMIC OUTLOOK REPORT 4



RIO | regional
investment
opportunities

A PROJECT OF
THE MURRAYLANDS REGIONAL DEVELOPMENT BOARD INC

Murraylands Economic Outlook Report 4: Education Analysis

A report prepared for



Prepared by



16 June 2008

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Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
CPI	Consumer Price Index
DEEWR	Department of Education, Employment and Workplace Relations
DEST	Department of Education, Science and Training (now DEEWR)
DTED	Department of Trade and Economic Development
ELICOS	English Language Intensive Courses for Overseas Students
fte	full time equivalent
GRP	Gross Regional Product
RIO	Regional Investment Opportunities
RISE	Regional Industry Structure and Employment
SAIBT	South Australian Institute of Business and Technology
TAFE	Technical and Further Education

Document History and Status

Doc Ver	Doc Status	Issued To	Qty elec	Qty hard	Date	Reviewed	Approved
1	DRAFT	Ann Herraman Brenton Lewis	1	-	10/04/08	JBM	JBM
2	FINAL	Ann Herraman Brenton Lewis	1	-	16/06/08	JBM	JBM

Printed: 17/06/2008 1:58:00 PM
 Last Saved: 17/06/2008 12:03:00 PM
 File Name: S:\1_Projects\Current\0634_Murraylands
 Outlook\Reports\Economic Outlook Report No 4\Education
 Report\Education Analysis_Final Report_080616.doc
 Project Manager: Julian Morison
 Principal Author/s: Lizzie Clark and Julian Morison
 Name of Client: Murraylands Regional Development Board Inc.
 Name of Project: Economic Outlook Report: Education Analysis
 Document Version: 2
 Job Number: 0634



1. Introduction

EconSearch Pty Ltd was contracted by the Murraylands Regional Development Board Inc to prepare a series of Economic Outlook Reports that provide investors, stakeholders and the community with an overview of the status of the Murraylands economy. Each Murraylands Economic Outlook Report consists of three key aspects, namely:

- Headline Analysis;
- Regional Investment Opportunities (RIO) Sector Analysis; and
- Standard Economic Analysis.

The aim of this additional analysis was to highlight the impact of developing an education precinct in the Murraylands region. A number of separate analyses were undertaken to highlight the various aspects of the education development, namely:

- the economic impact of capital development relating to expansion and construction of education facilities;
- the economic impact of an increase in education delivery to local students and the local workforce; and
- the economic impact of education delivery to international students.

The analysis presented in this report was undertaken by Lizzie Clark and Julian Morison (EconSearch Pty Ltd).



2. Method

The estimates of economic impact presented in this report were based on a *RISE* (Regional Industry Structure and Employment) model for the Murraylands region for 2002/03 prepared by the consultants for the Office of Regional Affairs (EconSearch 2005).

The method employed for estimation of economic impacts was input-output analysis. Input-output analysis provides a comprehensive economic framework that is extremely useful in the resource planning process. Broadly, there are two ways in which the input-output method can be used.

First, the input-output model provides a numerical picture of the size and shape of an 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.

Second, input-output analysis 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 that can then be applied to various growth or decline scenarios.

For a technical description of the input-output modelling procedure refer to Appendix 1 and for a glossary of input-output terminology refer to Appendix 2.

Economic impacts in this report have been specified in terms of the following indicators:

- output;
- employment; and
- contribution to gross regional product (GRP).

Output is a measure of the gross revenue of goods and services produced by commercial organisations plus gross expenditure by government agencies. This indicator needs to be used with care as it includes elements of double counting.

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

Contribution to GRP is a measure of the net contribution of an activity to the regional economy. Contribution to GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. It can also be measured as household income plus other value added (gross operating surplus and all taxes, less subsidies). It represents payments to the primary inputs of production (labour, capital and land). Using contribution to GRP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.

Estimates of the economic impact are presented in terms of

- direct impacts;
- flow-on (or indirect) impacts; and
- total impacts.

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

Flow-on (or indirect) impacts are the sum of production-induced effects and consumption-induced effects. Production-induced effects are additional output, employment and household income resulting from re-spending by firms (e.g. transport contractors) that receive payments from the sale of services to firms undertaking, for example, meat processing. Consumption-induced effects are additional output, employment and household income resulting from re-spending by households that receive income from employment in direct and indirect activities.



3. Background

The Murraylands Regional Development Board is currently developing a proposal to expand the delivery of post secondary education in the Murraylands region. The proposal involves development of an education precinct within the Rural City of Murray Bridge local government area.

The proposed development is expected to involve a diverse range of education and training providers and includes an upgrade of an existing site, expansion of an e-learning facility and development of a commercial precinct (comprising retail outlets to support student needs).

Demand analysis has been undertaken by the Murraylands Regional Development Board and has identified potential demand for expansion of post secondary courses relating to the following:

- **Correctional Services** – provide training for the proposed Mobilong Correctional Facility including relocation of James Nash House with potential for mature age students from overseas.
- **Equine Services** – provide jockey training and horse management training at the proposed relocated Murray Bridge Racing Club facility.
- **Meat Processing** – provide training for the workforce at T&R Pastoral Abattoirs and Meat Processing facilities at Murray Bridge and Lobethal.
- **Health and Medical Skills and Aged Care Services** – provide training for anticipated expansion of demand for health and medical skills and aged care services across the Murraylands and broader region, including relocation of James Nash House to Murray Bridge.

Each of these industries has already been identified as growth areas for the Murraylands region.



4. Data and Assumptions

The purpose of this section of the report is to summarise the data sources and assumptions that were used in imputing the regional economic impact for a series of education related scenarios.

It should be noted that analysis of each of the scenarios assumed that the Murraylands economy has the capacity to meet any additional demands for goods, services and labour. In a relatively open economy which has the capacity to increase output in most of the key supply industries, this is a valid assumption. However, if local supply conditions are tight (for either material inputs or labour), costs may increase as a result of higher demand and inputs, including labour, may be sourced from outside the region. If this is the case, estimates of regional economic impact may be overstated.

4.1 The Economic Impact of Construction and Expansion of Education Facilities

The proposed education facility would involve significant construction activity to upgrade and expand the existing facilities and provide additional contemporary standard facilities to suit a range of student requirements and delivery models. Overseas students would require student accommodation which would generate significant additional construction activity.

The costs associated with purchasing the development site (if necessary) and upgrading and expanding facilities were unknown at the time of undertaking the analysis. Current education and training related developments in South Australia are summarised in Table 4.1 to highlight the potential range in costs association with an education development.

As the cost associated with expansion and upgrade of existing facilities and construction of new facilities are unknown two alternative hypothetical scenarios been developed for the purpose of this analysis, namely:

- **Construction and expansion scenario one:** Cost of construction and expanding facilities is \$8 million.
- **Construction and expansion scenario two:** Cost of construction and expanding facilities is \$15 million.

Both scenarios are assumed to exclude the costs associated with purchasing land for the education development.

Table 4.1 Major education developments in South Australia, 2007

Description	Development Status	Location	Estimated Development Cost
Public private partnership to construct six new schools	Approved	Various	\$100 million
New buildings at Flinders University for research and teaching	In progress	Bedford Park	\$45 million
Henley High School new learning areas	In progress	Henley Beach	\$8.2 million
Kingscote Area School new facilities	In progress	Kingscote	\$8.6 million
Linden Park Primary School new learning areas	In progress	Linden Park	\$6.0 million
University of South Australia new research building	In progress	Magill	\$7.6 million
TAFE campus redevelopment	Approved	Marleston	\$17.5 million
Mawson Institute of Advanced Manufacturing (University of South Australia)	In progress	Mawson Lakes	\$11.3 million
University of South Australia new research building	In progress	Mawson Lakes	\$19.3 million
The University of Adelaide new buildings and major refurbishment of existing facilities	Pending	Adelaide	\$150 million
University of South Australia refurbishment of Reid Building	Under construction	Adelaide	\$13 million

Source: DTED (2007)

4.2 The Economic Impact of an Increase in Education Delivery to Local Students and Workforce

There are a number of opportunities to provide training to support existing businesses and industries in the Murraylands region and surrounding areas. Training programs and courses could support the following industry sectors:

- business services;
- construction;
- utilities (power generation and water use);
- tourism and hospitality;
- food processing;
- agriculture and horticulture;
- equine sector;
- manufacturing;
- health;
- correctional services;
- retail;
- transport logistics and storage; and
- mining.



There are a number of training opportunities that could be offered in the Murraylands region that could support these industry sectors. A range of courses are already available through existing training providers located within the region. An expansion of post-secondary education would seek to offer training opportunities not currently available or in short supply in the region.

Some examples of training courses that support the industry sectors in the Murraylands region are summarised in Table 4.2. The duration and tuition fees associated with each of these courses vary significantly.

Table 4.2 Examples of Murraylands industry related courses

Industry	Course
Business Services	Certificates on Financial Services
	Certificates in Business
	Diploma in Business
	Diploma in Business Management
Construction	Certificates in Building
	Diploma in Building
	Diploma in Building Design and Technology
Utilities	Certificates in Electrotechnology
	Diploma in Electrical Engineering
Tourism and Hospitality	Diploma in Event Management
	Diploma in Hospitality and Tourism
	Certificates & Diploma in Tourism and Tourism Management
Food Processing	Diploma in Food Science and Technology
	Certificates in Meat Processing
Agriculture and Horticulture	Certificate in Agriculture
	Certificate in Irrigation
	Certificate/Diploma in Horticulture
Equine Sector	Certificate in Racing
Manufacturing	Certificates in Engineering
Health	Certificates in Health Services
	Certificate in Aged Care Work
Retail	Certificate in Retail Operations
	Certificate/Diploma in Retail Management
Mining	Diploma in Geoscience
	Certificates in Mining Operations

Source: TAFE SA (2008)

Course durations depend on the nature and level of qualification and can range from 1 day up to 2 years. Tuition fees vary depending on the nature and duration of the individual course undertaken. For the purpose of the analysis it was assumed that the average fee per full-year student was \$7,820 (SAIBT 2007).¹

The actual number of students was unknown at the time of publication, to highlight the potential economic impact relating to an increase in education delivery to local (Murraylands and surrounding areas) students and workforce two hypothetical scenarios were developed, namely::

- **Regional education scenario one:** enrolment of 200 full-year (or equivalent) students.
- **Regional education scenario two:** enrolment of 500 full-year (or equivalent) students.

Estimates of economic impact were based on student expenditure on tuition fees and exclude government funded components of tuition costs.

4.3 The Economic Impact of Education Delivery to International Students

In 2006, approximately 19,000 students from outside Australia enrolled in a higher education institution in South Australia² (DEST 2007). In addition to this TAFE hosts more than 1,500 international students per year (TAFE 2007).

Preliminary discussions with overseas universities have been undertaken and indicate that there is potential to provide international students with access to courses and training in a number of areas, including:

- health and aged care;
- mining;
- transport and logistics;
- heavy vehicle management;
- meat processing;
- horticulture;
- welding and metal fabrication;
- building and construction;
- correctional services;
- business services; and
- management

Economic analyses were undertaken to highlight the potential economic impact associated with delivery of further education to overseas students. Economic benefit would be generated as a result of course/tuition fees paid by the students and living expenditure spent in the Murraylands (e.g. accommodation, transport and recreation).

¹ Based on the 2008 tuition fees for a Certificate IV undertaken at the South Australian Institute of Business and Technology (SAIBT).

² Includes enrolments at Adelaide College of Divinity, Australian Lutheran College, Carnegie Mellon University, International College of Hotel Management Inc., South Australian Institute of Business and Technology Pty Ltd., Tabor College Adelaide, The Flinders University of South Australia, The University of Adelaide and University of South Australia.

Tuition fees paid by international students are likely to vary depending on the nature and level of the course. Estimates of the expected range in course fees associated with various programs of study are summarised in Table 4.3.

Table 4.3 Estimated range in annual tuition fees for selected courses for international students

Description	Estimated Tuition Fees (\$ per year)
Foundation Studies	
University Entrance	\$9,000 - \$14,000
Preparatory	\$9,000 - \$14,000
Bridging Courses	\$9,000 - \$14,000
Undergraduate	
Bachelor Degrees (e.g. arts, economic, law and business)	\$10,000 - \$13,500
Laboratory-based Bachelor Degrees (e.g. science and engineering)	\$11,000 - \$16,500
Postgraduate	
Graduate Certificates	\$9,000 - \$16,000
Graduate Diplomas	\$9,000 - \$16,000
Masters	\$11,000 - \$18,500
Doctoral Degrees	\$11,000 - \$18,500
Vocational Education and Training	
Certificates I - IV	\$5,500 - \$18,000
Diploma	\$5,500 - \$18,000
Advanced Diploma	\$5,500 - \$18,000

Source: DEEWR (2008)

Estimates of economic impact were based on the assumption that the average annual course fee paid was \$11,000.

In 2004 a survey was undertaken by the University of Queensland Social Research Centre (UQSRC) of non-tuition fee expenditure by international students enrolled in higher education, vocational education and training, secondary school and English language intensive courses for overseas students (ELICOS). The average expenditure data, for students studying in South Australia, were updated to 2007/08 dollars using CPI and are summarised in Table 4.4.

The updated survey results indicate that, on average, international student in South Australia spend just over \$500 per week. Major expenditure items include housing (e.g. rent or board), food and groceries, course related expenditure (e.g. textbooks) and entertainment and recreation. Based on an average weekly expenditure of \$514, annual expenditure was estimated to be approximately \$26,700 per student (Table 4.4).



Table 4.4 Estimated average expenditure by international students, 2007/08

Category of Expenditure	Average Expenditure (\$/week)	Estimated Annual Expenditure (\$/year)
Housing	141	7,319
Utility Costs	11	559
Telephone Costs	31	1,620
Health Costs	15	782
Food and Groceries	110	5,699
Alcohol and Cigarettes	11	559
Car Costs	21	1,117
Transport	10	503
Entertainment and Recreation	31	1,620
Clothing	19	1,006
Houshold Goods	12	615
Overseas Travel	12	615
Course Related Expenses ^a	37	1,900
Other Expenses	8	391
Other Major Expenses	46	2,402
Average Total Expenditure	514	26,706

^a Course related expenditure excludes tuition fees.

Source: UQSRC (2005) and ABS (2008)

The actual number of students was unknown accordingly two hypothetical scenarios were developed to highlight the economic impact of education delivery to international students in the Murraylands, namely:

- **International student education scenario one:** enrolment of 200 full-year (or equivalent) international students.
- **International student education scenario two:** enrolment of 500 full-year (or equivalent) international students.

Estimates of economic impact were based on expenditure on tuition fees of \$11,000 per student per year and living expenses of \$26,706 per student per year.

5. Economic Impact of Construction and Expansion of Education Facilities

Analyses were undertaken to assess the economic impact associated with two alternative scenarios, namely:

- **Scenario One:** Cost of construction and expanding facilities is \$8 million.
- **Scenario Two:** Cost of construction and expanding facilities is \$15 million.

The results of the economic analyses are presented, in turn, in the following sections.

It should be noted that the estimates of economic impact assume that the increase in demand for building construction will have no discernable effect on the cost of goods and services used in the construction process or the cost of labour. As noted in Section 4, in a relatively open economy which has reasonable capacity to increase output in most of the key supply industries, this is a valid assumption. However, if local supply conditions are tight (for either materials inputs or labour), costs may increase, inputs and even labour may be sourced from outside the region and the impact on the Murraylands economy may not be as large as Tables 5.1 and 5.2 suggest.

5.1 Economic Impact of Construction and Expansion: Scenario One

Estimates of the net regional economic impact of construction relating to the upgrade and expansion of post secondary education facilities in the Murraylands region are provided in Table 5.1 and illustrated in Figures 5.1 and 5.2.

Estimates of economic impact were based on the assumption that the costs associated with construction and upgrade of facilities would result in an \$8.0 million increase in building construction output (Table 5.1).

Building and construction activity, of the magnitude detailed above, would generate an estimated 74 fte jobs in the Murraylands regional economy. Approximately 42 of these fte jobs would be generated directly in building and construction and the remaining 32 fte would be flow on jobs into other sector of the regional economy (Table 5.1).

Jobs in building construction would account for 58 per cent of the total employment impact (Figure 5.1). Flow-on employment would be concentrated in trade, manufacturing, property and business services and transport and storage sectors.

An estimated \$6.3 million (in 2008 dollars) in GRP would be generated in the Murraylands regional economy in 2007/08 as a result of building and construction activity. An estimated \$4.0 million would be generated directly and the remainder in flow-ons to other industry sectors (Table 5.1).

GRP in the building construction sector would account for 68 per cent of the total GRP impact (Figure 5.2). The remaining GRP would be generated in the trade, manufacturing and property and property and business services sectors.

Table 5.1 Estimated regional economic impact of construction and expansion of education facilities in 2007/08, scenario one (\$8 million)

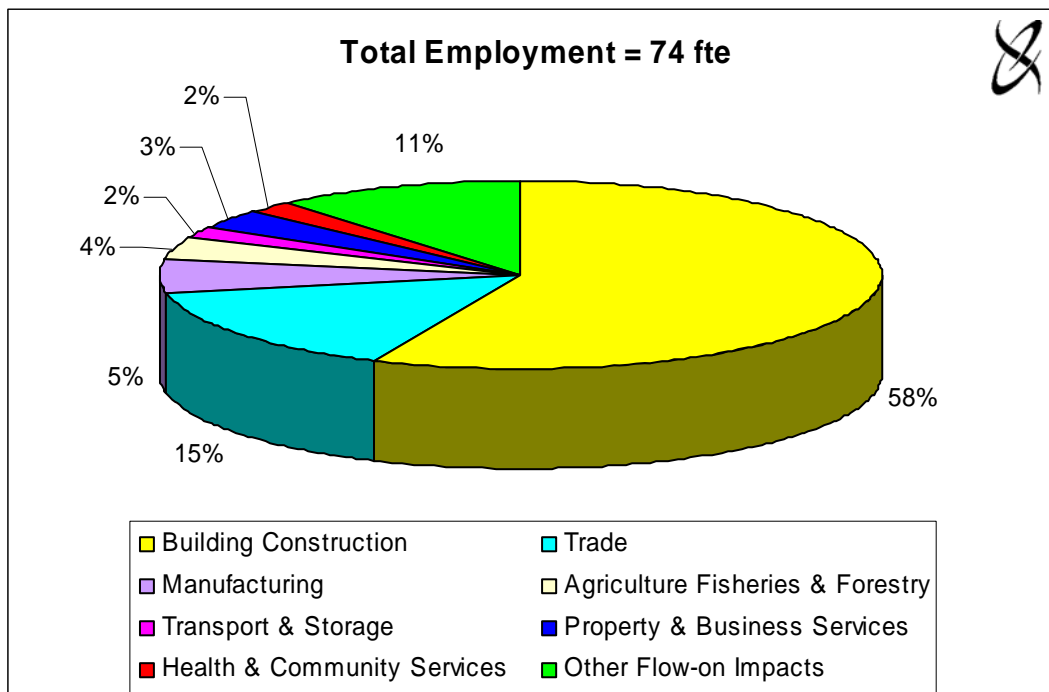
Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
Building Construction	8.0	42	4.0
Flow-on impacts			
Trade		11	0.4
Manufacturing		4	0.3
Agriculture, Fisheries & Forestry		3	0.2
Transport & Storage		1	0.1
Property & Business Services		2	0.2
Health & Community Services		2	0.1
Other Flow-on Impacts		8	1.0
Total flow-on impact		32	2.2
Total ^b		74	6.3

^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

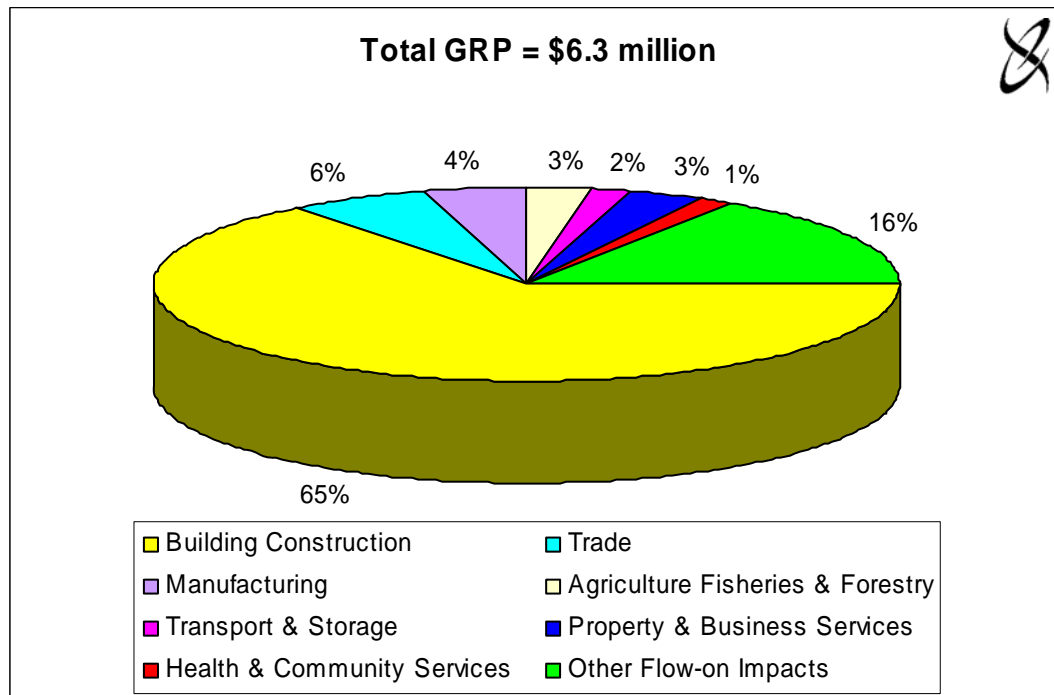
Source: EconSearch analysis.

Figure 5.1 Distribution of employment impacts for construction and expansion of education facilities in 2007/08, scenario one (\$8 million)



Source: EconSearch analysis.

Figure 5.2 Distribution of GRP impacts for construction and expansion of education facilities in 2007/08, scenario one (\$8 million)



Source: EconSearch analysis.

5.2 Economic Impact of Construction and Expansion: Scenario Two

Estimates of the net regional economic impact of capital development relating to the expansion of post secondary education facilities in the Murraylands region are provided in Table 5.2. The distribution of these impacts is similar to those presented in Figures 5.1 and 5.2.

Estimates of economic impact were based on the assumption that the costs associated with construction and upgrade of facilities would result in an \$15.0 million increase in building construction output (Table 5.2).

It was estimated that 140 fte new jobs would be generated in the Murraylands regional economy by construction and expansion of education facilities. Approximately 79 of these jobs would be generated directly in the building construction sector and 61 flow-on jobs in other sectors of the regional economy.

An estimated \$11.8 million in GRP would be generated in the Murraylands economy by construction and expansion of education facilities, \$7.6 million directly and \$4.2 million in flow-on GRP in other sectors of the regional economy.

Table 5.2 Estimated regional economic impact construction and expansion of education facilities in 2007/08, scenario two (\$15 million)

Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
Building Construction	15.0	79	7.6
Flow-on impacts			
<i>Trade</i>		21	0.7
<i>Manufacturing</i>		8	0.5
<i>Agriculture, Fisheries & Forestry</i>		5	0.3
<i>Transport & Storage</i>		3	0.2
<i>Property & Business Services</i>		5	0.4
<i>Health & Community Services</i>		3	0.2
<i>Other Flow-on Impacts</i>		16	1.9
Total flow-on impact		61	4.2
Total		140	11.8

^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

Source: EconSearch analysis.



6. The Economic Impact of an Increase in Education Delivery to Local Students and Workforce

Estimates of regional economic impact of an increase in education delivery to residents of the Murraylands and surrounding areas have been undertaken for two alternative scenarios, namely:

- **Scenario one:** enrolment of 200 full-year (or equivalent) Murraylands students.
- **Scenario two:** enrolment of 500 full-year (or equivalent) Murraylands students.

Estimates of regional economic impact are based on student expenditure on tuition fees and exclude any government funded component of course costs.

The analysis assumes that the economy has the capacity to meet demands for additional goods, services and labour. The extent to which this is not the case, the estimates provided in Tables 6.1 and 6.2 will overstate the impact on the Murraylands economy.

6.1 Education for Local Students and Workforce: Scenario One

Estimates of the net regional economic impact relating to an increase in delivery of post-secondary education to students and workers in the Murraylands region are provided in Table 6.1 and illustrated in Figures 6.1 and 6.2.

Table 6.1 Estimated regional economic impact of education for local students and workforce in 2007/08, scenario one (200 students)

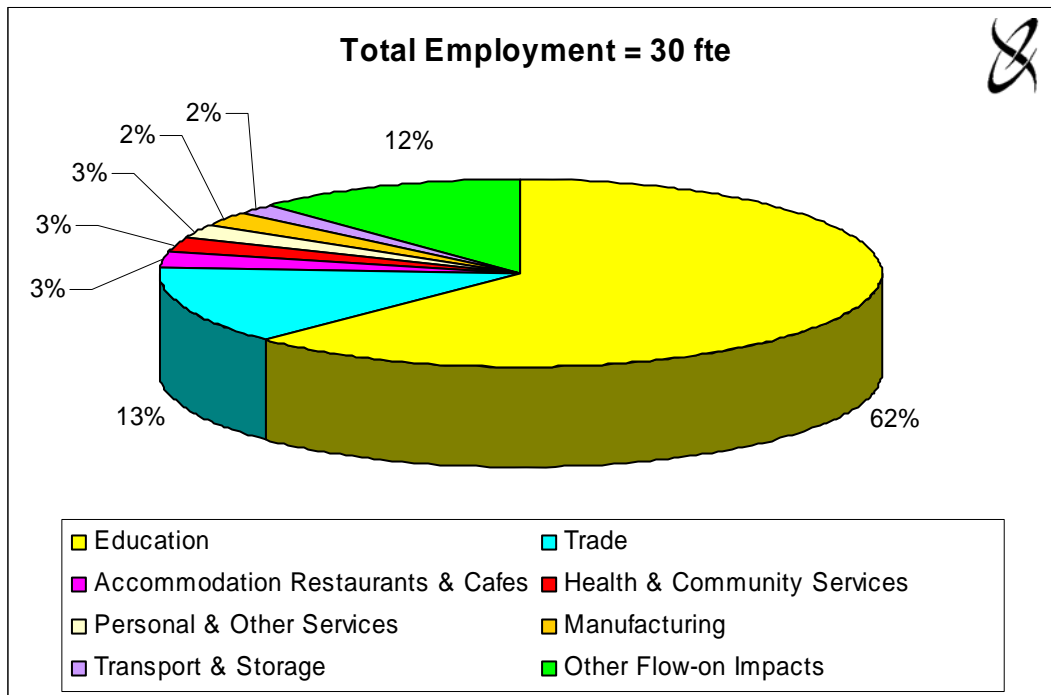
Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
Education	1.56	19	1.19
Flow-on impacts			
<i>Trade</i>		4	0.13
<i>Accommodation Restaurants & Cafes</i>		1	0.03
<i>Health & Community Services</i>		1	0.04
<i>Personal & Other Services</i>		1	0.05
<i>Manufacturing</i>		1	0.05
<i>Transport & Storage</i>		1	0.04
<i>Other Flow-on Impacts</i>		4	0.47
Total flow-on impact ^b		11	0.80
Total ^b		30	1.99

^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

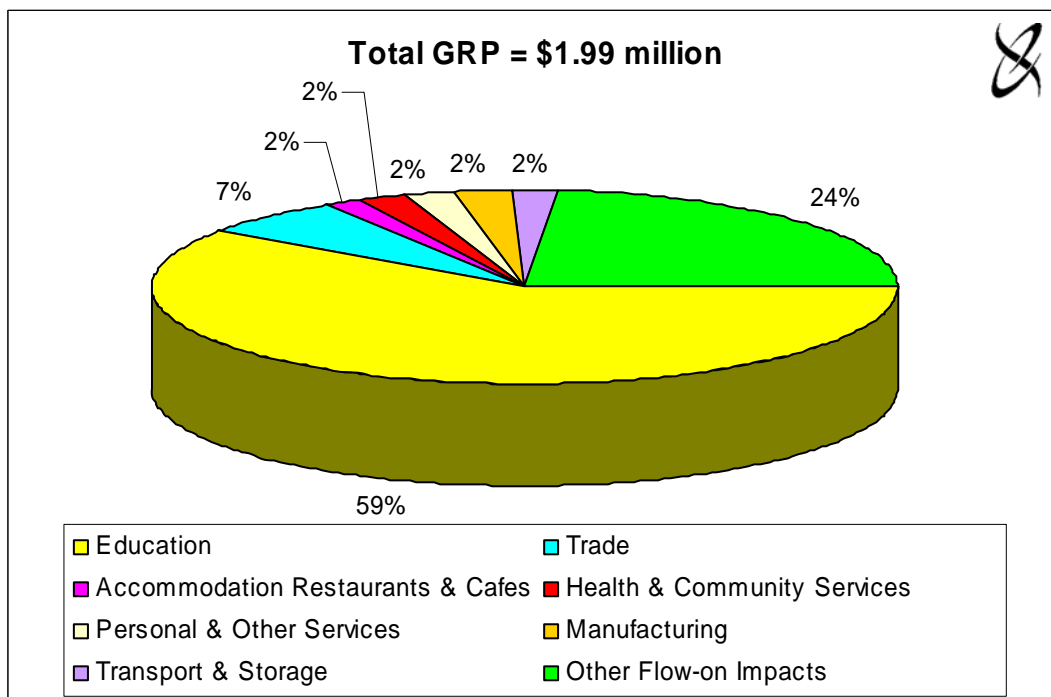
Source: EconSearch analysis.

Figure 6.1 Distribution of employment impacts of education for local students and workforce in 2007/08, scenario one (200 students)



Source: EconSearch analysis.

Figure 6.2 Distribution of GRP impacts of education for local students and workforce in 2007/08, scenario one (200 students)



Source: EconSearch analysis.



Estimates of regional economic impact, for scenario one, were based on the assumption that the new facility would attract 200 full year (or equivalent) students from within the Murraylands region who would pay an average of \$7,820 per year in tuition fees. This equates to an increase in the education sector output of \$1.56 million (Table 6.1).

It was estimated that 30 fte new jobs would be generated in the Murraylands in response to the increase in education delivery of the magnitude detailed above. Approximately 19 of these jobs (62 per cent) would be generated directly in the education sector and 11 flow-on jobs would be generated in other sectors of the regional economy.

Job generated in the education sector would account for 62 per cent of the total employment impact (Figure 6.1). Flow-on jobs would account for the balance of the total employment impact and would be concentrated in trade, accommodation, restaurants and cafes, health and community services and personal and other services.

It was estimated that almost \$2.0 million (in 2008 dollars) in additional GRP would be generated in the Murraylands regional economy in response to an increase in education delivery to local residents. Approximately \$1.2 million in GRP would be generated directly in the education sector and \$0.8 million in flow-on GRP would be generated in other sectors of the regional economy.

GRP generated in the education sector would account for 59 per cent of the total impact, with the balance being attributed to flow-ons in other sectors of the regional economy (Figure 6.2).

6.2 Education for Local Students and Workforce: Scenario Two

Estimates of the net regional economic impact relating to delivery of post- secondary education to students and workers in the Murraylands region are provided in Table 6.2. The distribution of these impacts is similar to those presented in Figures 6.1 and 6.2.

Estimates of regional economic impact, for scenario two, were based on the assumption that the new facility would attract 500 full year (or equivalent) students from within the Murraylands region and surrounding areas who would pay an average of \$7,820 per year in tuition fees. This equates to an increase in the education sector output of \$3.91 million (Table 6.2).

It was estimated that approximately 74 fte new jobs would be generated in response to an increase in education delivery in the Murraylands. The majority of these jobs (46 fte) would be generated in the education sector and the remainder (28 fte) in flow-ons to other sectors of the regional economy.

Table 6.2 Estimated regional economic impact of education for local students and workforce, scenario two (500 students)

Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
Education	3.91	46	2.96
Flow-on impacts			
<i>Trade</i>		10	0.33
<i>Accommodation Restaurants & Cafes</i>		2	0.08
<i>Health & Community Services</i>		2	0.10
<i>Personal & Other Services</i>		2	0.11
<i>Manufacturing</i>		2	0.12
<i>Transport & Storage</i>		1	0.10
Other Flow-on Impacts		9	1.17
Total flow-on impact ^b		28	2.00
Total ^b		74	4.97

^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

Source: EconSearch analysis.

6.3 Other Facets of Regional Economic Development Associated with Education Activity in the Region

In addition to the quantifiable economic impacts outlined above there are a number of other facets of the regional economic development associated with education activity within the Murraylands region, namely:

- population retention and attraction;
- skilled workforce;
- low unemployment; and
- higher household incomes.

Population retention

Increasing education opportunities available within the region may assist with population retention. Many residents, particularly young people, are likely to move away from the region to undertake post secondary education and training. An increase in education delivery in the Murraylands could reduce the number of people who leave the region.

Improved education facilities may also assist in attracting new residents to the Murraylands region.

Skilled workforce

Increasing opportunities for obtaining post-secondary education within the region has the potential to increase the level of skills within the workforce. A higher proportion of skilled labour in the workforce will assist existing businesses in satisfying their workforce requirements and potentially attract new businesses and industries to the region.

Lower levels of unemployment

Higher levels of education and training are likely to correspond with lower levels of unemployment and poverty. Low unemployment has many social and economic benefits. Employed individuals and households are more likely to be actively involved in society and social activities and income earned provides individuals and households with greater opportunities to save, borrow and invest.

Higher household income potential

It is likely that there is a positive correlation between higher levels of education and higher income earnings. An increase in the level of household income has flow-on social and economic benefits across the community.



7. The Economic Impact of Education Delivery to International Students

Two alternative scenarios were developed to highlight the economic impact of education delivery to international students in the Murraylands, namely:

- **Scenario one:** enrolment of 200 full-year (or equivalent) international students.
- **Scenario two:** enrolment of 500 full-year (or equivalent) international students.

Estimates of economic impact associated with each scenario are presented in the following sections. The analysis assumes that the economy has the capacity to meet demands for additional goods, services and labour. The extent to which this is not the case, the estimates provided in Tables 7.1 and 7.2 will overstate the impact on the Murraylands economy.

7.1 International Student Education: Scenario One

Estimates of the net regional economic impact of additional education and household expenditure by international students in the Murraylands region are provided in Table 7.1 and illustrated in Figures 7.1 to 7.3.

Table 7.1 Estimated regional economic impact of international student education in 2007/08, scenario one (200 students)

Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
<i>Education</i>	2.2	26	1.7
<i>Trade</i>	1.8	28	0.9
<i>Accommodation Restaurants & Cafes</i>	1.5	15	0.6
<i>Communication Services</i>	0.1	1	0.1
<i>Cultural & Recreational Services</i>	0.1	1	0.1
<i>Health & Community Services</i>	0.1	1	0.1
<i>Other Direct</i>	0.4	2	0.2
Total direct ^b	6.1	74	3.5
Flow-ons		34	2.3
Total ^b		108	5.8

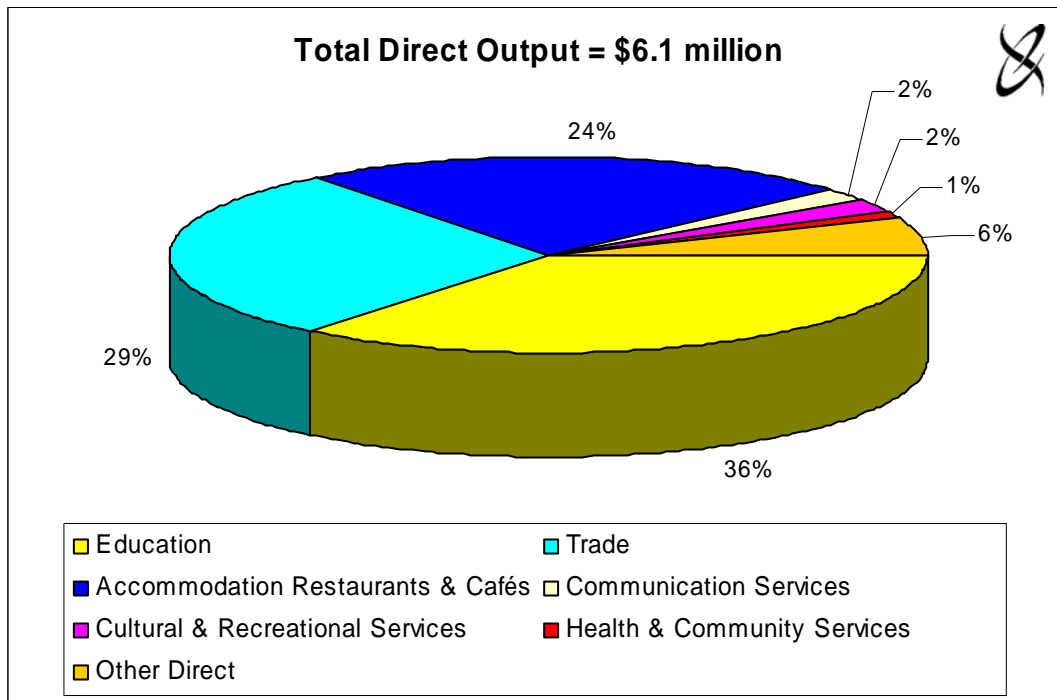
^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

Source: EconSearch analysis.

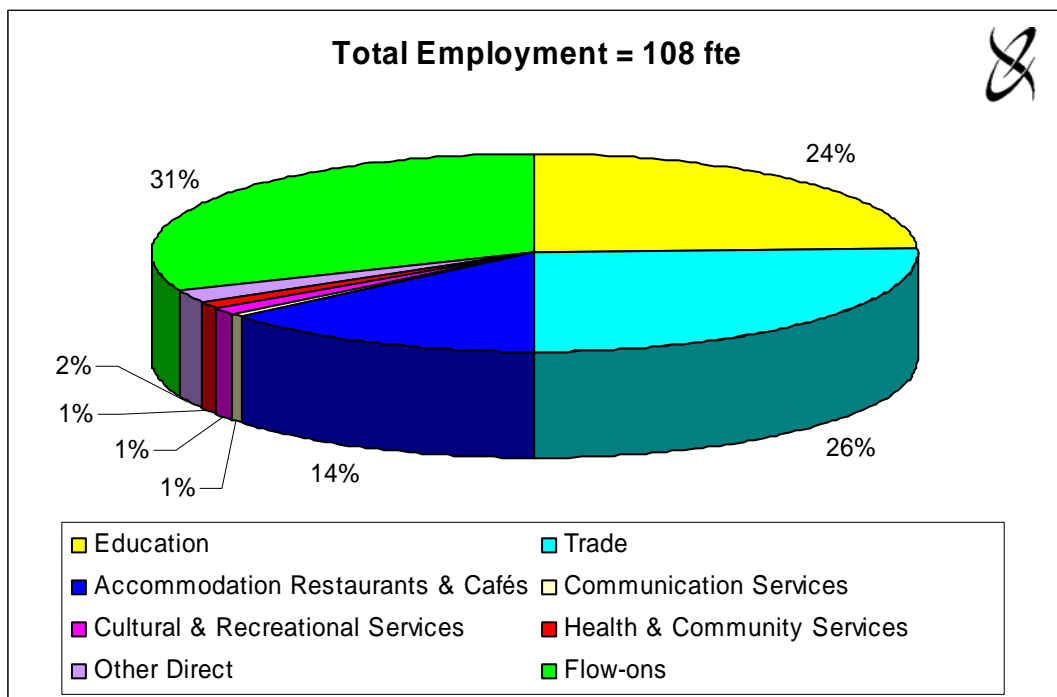
Enrolment of 200 full-year (or equivalent) international students would result in an increase in the value of output of approximately \$6.1 million (Table 7.1). This output includes \$2.2 million in tuition fees and \$3.9 million in living expenses (Figure 7.1).

Figure 7.1 Distribution of direct output of international student education in 2007/08, scenario one (200 students)



Source: EconSearch analysis.

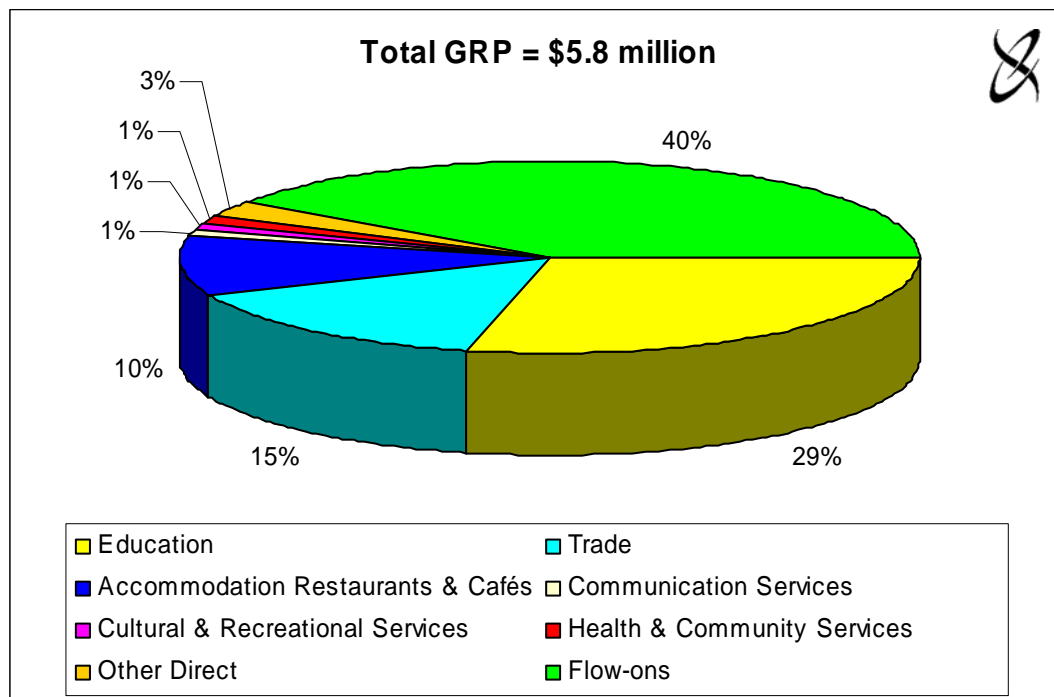
Figure 7.2 Distribution of employment impacts of international student education in 2007/08, scenario one (200 students)



Source: EconSearch analysis.



Figure 7.3 Distribution of GRP impacts of international student education in 2007/08, scenario one (200 students)



Source: EconSearch analysis.

Expenditure by international students would generate direct employment of around 74 fte in the Murraylands region. Flow-on business activity would generate a further 34 fte jobs, to give a total employment impact of approximately 108 fte jobs.

Employment in the education sector would account for 24 per cent of the total employment impact. Direct employment would also be significant in the trade, accommodation, restaurants and cafes and cultural and recreational services sectors (Figure 7.2).

Total contribution to GRP in the Murraylands region attributable to international student expenditure was estimated to be approximately \$5.8 million, just over \$3.5 million directly and \$2.3 million in other sectors of the regional economy.

Direct contribution to GRP would be predominantly in education (29 per cent of total), trade (15 per cent) and accommodation, restaurants and cafes (10 per cent). Flow-ons to other sectors of the regional economy would account for 40 per cent of the total GRP impact (Figure 7.3).

7.2 International Student Education: Scenario Two

Estimates of economic impact of additional education and household expenditure by international in the Murraylands region are provided in Table 7.2. The distribution of these impacts is similar to those presented in Figures 7.1 to 7.3.

Table 7.2 Estimated regional economic impact of international student education in 2007/08, scenario two (500 students)

Sector	Output ^a	Employment	Contribution to GRP
	\$m	fte	\$m
<i>Education</i>	5.5	65	4.2
<i>Trade</i>	4.4	69	2.2
<i>Accommodation Restaurants & Cafes</i>	3.7	38	1.4
<i>Communication Services</i>	0.3	2	0.2
<i>Cultural & Recreational Services</i>	0.3	3	0.2
<i>Health & Community Services</i>	0.2	3	0.1
<i>Other Direct</i>	0.9	6	0.4
Total direct ^b	15.3	185	8.7
Flow-ons		84	5.9
Total ^b		270	14.5

^a To avoid double counting only direct output impacts have being reported.

^b Totals may not sum due to rounding.

Source: EconSearch analysis.

Enrolment of 500 full-year (or equivalent) international students would result in an increase in expenditure of approximately \$15.3 million (Table 7.1). This expenditure would be comprised of approximately \$5.5 million in tuition fees and \$9.8 million in living expenses (Figure 7.1).

International student expenditure would generate direct employment of around 185 fte in the Murraylands region. Flow-on business activity would result in a further 84 fte jobs, to give a total employment impact of approximately 270 fte jobs.

It is estimated that total contribution to GRP attributable to the international student expenditure would be approximately \$14.5 million. Approximately \$8.7 million generated by international student expenditure directly and \$5.9 million in flow-ons to other sectors of the regional economy.



8. Summary of Results

A number of separate analysis were undertaken to highlight the various aspects of the education development, namely:

- the economic impact of capital development relating to expansion and improvement of education facilities;
- the economic impact of an increase in education delivery to local students and workforce; and
- the economic impact of education delivery to international students.

Two scenarios were developed for each aspect of the development to provide a range in potential impact. Two examples of aggregate economic impact have been calculated that reflect the 'low' and 'high' values of each scenario. The scenarios used for calculation of aggregate economic impact are summarised in Table 8.1

Table 8.1 Assumptions for education development scenarios ^a

	Low	High
Upgrade and Construction Costs (\$)	8,000,000	15,000,000
Number of Local Students (no.)	200	500
Number of International Students (no.)	200	500

^a Based on assumptions detailed in Section 4.

Estimates of the aggregate impacts for each example (low and high) for 2007/08 are presented in Table 8.2. Based on the assumptions and scenarios used as a basis for the analyses, the total employment generated from increased education delivery in the Murraylands would range between 212 and 484 and addition GRP would add \$14.1 to \$31.3 million. Compared to current estimated of employment in the region the construction and increased education delivery would increase employment in the region by between 1.4 and 3.3 per cent.

Table 8.2 Aggregate regional economic impact of an education development in the Murraylands region, 2007/08

Sector	Low ^a			High ^a		
	Output ^b	Employment	Contribution to GRP	Output ^b	Employment	Contribution to GRP
	\$m	fte	\$m	\$m	fte	\$m
Direct Impacts						
<i>Education</i>	3.8	45	2.9	9.4	112	7.1
<i>Building Construction</i>	8.0	42	4.0	15.0	79	7.6
<i>Trade</i>	1.8	28	0.9	4.4	69	2.2
<i>Accommodation Restaurants & Cafes</i>	1.5	15	0.6	3.7	38	1.4
<i>Communication Services</i>	0.1	1	0.1	0.3	2	0.2
<i>Cultural & Recreational Services</i>	0.1	1	0.1	0.3	3	0.2
<i>Health & Community Services</i>	0.1	1	0.1	0.2	3	0.1
<i>Other Direct</i>	0.4	2	0.2	0.9	6	0.4
Total direct ^c	15.7	135	8.7	34.2	311	19.2
Total flow-on impact ^c		77	5.4		173	12.0
Total ^b		212	14.1		484	31.3

^a Based on assumptions detailed in Table 8.1

^b To avoid double counting only direct output impacts have being reported.

^c Totals may not sum due to rounding.

Source: EconSearch analysis.

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Disclaimer

We have prepared the above report exclusively for the use and benefit of our client. Neither the firm nor any employee of the firm undertakes responsibility in any way whatsoever to any person (other than to the above mentioned client) in respect of the report including any errors or omissions therein however caused.

Appendix 1 Input-Output Methodology

Overview of Input-Output Analysis

Input-output analysis provides a comprehensive economic framework that is extremely useful in the resource planning process. Broadly, there are two ways in which the input-output method can be used.

First, the input-output model provides a numerical picture of the size and shape of an economy and its essential features. The input-output transactions model 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.

Second, input-output analysis 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 that can then be applied to various development scenarios.

Linkages between sectors

The standard approach for the estimation of the regional economic impact of a particular activity, such as pig production, is to employ *input-output analysis*. The input-output model conceives the economy of the region as being divided up into a number of sectors, and this allows the analyst to trace expenditure flows.

To illustrate this, consider the example of a piggery that, in the course of its operation, purchases goods and services from other sectors. These goods and services would include feed, power, and, of course, labour. The direct employment created is regarded in the model as an expenditure flow into the household sector, which is one of several non-industrial sectors recognised in the input-output model.

Upon receiving expenditure by the piggery, the other sectors in the regional economy engage in their own expenditures. For example, as a consequence of winning a contract for work with a piggery, a feedstuff producer buys materials from its suppliers and labour from its own employees. Suppliers and employees in turn engage in further expenditure, and so on. These *indirect effects*, as they are called, are part of the impact of the piggery on the regional economy. They must be added to the *direct effects* (which are expenditures made in immediate support of the piggery itself) in order to arrive at a measure of the total impact of the piggery.

It may be thought that these indirect effects go on indefinitely, and that their amount adds up without limit, the presence of *leakages*, however, prevents this from occurring. In the context of the impact on a *regional* economy, an important leakage is expenditure on imports, that is, products or services that originate from *outside the region, state or country* (e.g. machinery).

Thus some of the expenditure on imports to the region is lost to the local economy. Consequently, the indirect effects get smaller and smaller in successive expenditure rounds, due to this and other leakages. Hence the total expenditure created in the local economy is limited in amount, and so (in principle) it can be measured.

The performance of the input-output analysis calculations require a great deal of information. The analyst needs to know the magnitude of various expenditures and where they occur. Also needed is information on how the sectors receiving this expenditure share *their* expenditures among the various sectors from whom they buy, and so on, for the further expenditure rounds.

In applying the input-output model, the standard procedure is to determine the direct or first-round expenditures only. No attempt is made to pursue such inquiries on expenditure in subsequent rounds, not even (for example) to trace the effects in the local economy on household expenditures by piggery employees on food, clothing, entertainment, and so on, as it is impracticable to measure these effects for an individual case, here the piggery.

The input-output model is instead based on a set of assumptions about constant and uniform proportions of expenditure. If households in general in the local economy spend (say) 13.3 per cent of their income on food and non-alcoholic beverages, it is assumed that those working in piggeries do likewise. Indeed, the effects of all expenditure rounds after the first are calculated by using such standard proportions (*multiplier* calculations).

Multipliers

Multipliers are an indication of the strength of the linkages between a particular sector and the rest of the regional economy. As well, they can be used to estimate the impact of a change in that particular sector on the rest of the economy. As noted above, detailed explanations on calculating input-output multipliers (and the underlying assumptions) are provided in any regional economics or input-output analysis textbook (see for example Jensen and West (1986)). Suffice to note that they are calculated through a routine set of mathematical operations based on coefficients derived from the input-output transactions model.

Input-output transactions model

The structure and linkages of a local economy can be described with the aid of input-output analysis. Input-output analysis, as an accounting system of inter-industry transactions, is based on the notion that no industry exists in isolation.

This assumes, within any economy, each firm depends on the existence of other firms to purchase inputs from, or sell products to, for further processing. The firms also depend on final consumers of the product and labour inputs to production. An input-output transactions model is a convenient way to illustrate the purchases and sales of goods and services taking place in an economy at a given time.

Input-output models provide a numerical picture of the size and shape of the economy and its essential features. Products produced in the economy are aggregated into a number of groups of industries and the transactions between them recorded in the transactions model. The rows and columns of the input-output model can be interpreted in the following way:

- The rows of the input-output model illustrate sales for intermediate usage (to other firms) and for final demand (consumers, exports, capital formation).
- The columns show the origin of the inputs and hence the purchases made at that time (labour, capital and intermediate inputs).

- Each item is shown as a purchase by one sector and a sale by another, thus constructing two sides of a double accounting schedule.

In summary, the input-output transactions model can be used to describe some of the important features of a regional economy, the interrelationships between sectors, and the relative importance of the individual sectors. The model is also used for the calculation of sector multipliers and the estimation of economic impacts arising from some change in the local economy.



Appendix 2 Glossary of Input-Output Terminology

Basic value is the price received for a good or service by the producer. It is also known as *producers' price*. It excludes indirect taxes and transport, trade and other margins.

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".

Contribution to gross state/regional product 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). Contribution to GSP/GRP 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.

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.

Exports refers to the sale of goods and services to final consumers outside the region of interest. In a state input-output model, exports refers to the sale of goods and services interstate and overseas. In a regional input-output model exports refers to the sale of goods and services interstate, overseas and to other regions within the state.

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

Household income is wages and salaries, drawings by owner operators 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 model is a transactions model 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 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.

Purchasers' price is the price paid for a good or service paid by the purchaser. It includes indirect taxes and transport, trade and other margins.

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 $(\text{direct effects} + \text{production-induced effects}) / \text{direct effects}$.

Type II multiplier is calculated as $(\text{direct effects} + \text{production-induced effects} + \text{consumption-induced effects}) / \text{direct effects}$.

