ESTABLISHMENT OF SPECIAL ECONOMIC ZONES

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2008 BARWON DARLING

SOCIO-ECONOMIC ZONE

MODEL

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EXECUTIVE SUMMARY

The Barwon Darling region has become considerably more disadvantaged since 2001, with much of the decline in counterpoint to otherwise state wide growth patterns. Without an initiative of some form being implemented, it is expected this slide will continue into the future. As such, the adoption of a socio-economic zone, in conjunction with other programmes, is likely to have a positive impact when it comes to improving the welfare and social situation of the people of the Barwon Darling region.

The general rationale for socio-economic zones is to promote employment growth (especially for targeted groups such as indigenous persons and the long term unemployed) and to increase business investment. However, the specific rationales for the implementation of a socio-economic zone in the Barwon Darling region are:

1. To achieve restructuring that will promote the long-term sustainability of the Barwon Darling region.

2. To alleviate the relatively high levels of economic and social disadvantage in the Barwon Darling region compared to the average for a New South Wales community.

3. To address the perceived failure of the existing framework of development policies to tackle the structural and long-term development problems of the region.

4. To address the failure of the free operation of the market to generate economic development and to provide social opportunities such as a good quality education and employment for indigenous persons and the long-term unemployed.

5. To allow the Barwon Darling community to form a stronger partnership with government to promote economic development in the region.

A Socio-Economic Zone Index (SEZI) measure was reapplied to the individual Local Government Areas (LGAs) and the Barwon Darling region as a whole using updated 2006 census data. In comparison to 2003;

- The LGA of Bourke saw a significant decline and now qualifies for disadvantaged status under the SEZI score system; and

- The SEZI score for the Barwon Darling region as a whole has increased indicating further disadvantage compared to the rest of NSW.

Shift share analysis has indicated that between 2001 and 2006;

- Total employment fell by 1,393 jobs;

- Increases were in the health and community services sector, followed by electricity, gas and water supplies, education, and cultural and recreational services, predominantly as a result of state wide growth trends and industry mix components; and

- Greatest declines occurred in agriculture, forestry and fisheries, followed by retail trade, wholesale trade and manufacturing.

It would appear that the greatest negative impact for employment in the region is local factors, positively impacting on only two industries, electricity, gas and water supply, and cultural and recreational services.

Using Input Output techniques, a comparison of the economic impact of both the Barwon Darling region and a socio-economic zone between 2000-01 and 2006-07 indicates;

- Gross regional product has declined between 2000-01 and 2006-07 by some 39% to $364 million;

- Household income has fallen by 22% to $196.1 million;

- Average household income has risen due to shifts in industry employment away from low paid positions in agriculture, retail and wholesale trade, and manufacturing;

- A socio-economic zone, should one be established, would be expected to cost $5.9 million per annum to run and maintain; and

- The impact of such a zone on gross regional product would be slightly higher than that estimated for 2000-01 at $26.2 million and would be likely to boost household income by some $14.1 million through the creation of 421 new full time equivalent positions.

Introduction

1   INTRODUCTION

1.1   Project Background

The Western Research Institute (WRI) first developed a socio-economic zone model for the Barwon Darling Alliance (BDA) in 2002, which was then updated in 2003. In 2008 the BDA commissioned the WRI to update the socio-economic zone model with recently released 2006 Australian Bureau of Statistics Census data.

Project objectives are outlined below:

- Measure economic and social disadvantage in the Barwon Darling region using Socio-Economic Zone Indicators (SEZI).

- Compare industry performance in the Barwon Darling region with NSW (excluding Sydney) utilising shift-share analysis to account for state-wide growth, industry growth and local factors.

- Estimate the economic impact of the Barwon Darling socio-economic zone policy in terms of employment, household income and gross regional product.

Using comparable methodology and assumptions as in The Barwon Darling Enterprise Zone report of 2003, this update is intended to be read in conjunction with that earlier report and to allow comparison of the shift in economic standing of the region over the intervening time period.

1.2   Barwon Darling Alliance

The mission of the Barwon Darling Alliance is to combine its members' resources to support and maintain sustainable economic growth and employment in the region and to develop positively the social capital and the lifestyle and culture of its people.

The Barwon Darling Alliance consists of:

- Murdi Paaki Regional Assembly

- Bourke Shire Council

- Brewarrina Shire Council

- Central Darling Shire Council

- Coonamble Shire Council

- Walgett Shire Council

Map 1: The Barwon Darling Alliance in Relation to NSW as a Whole
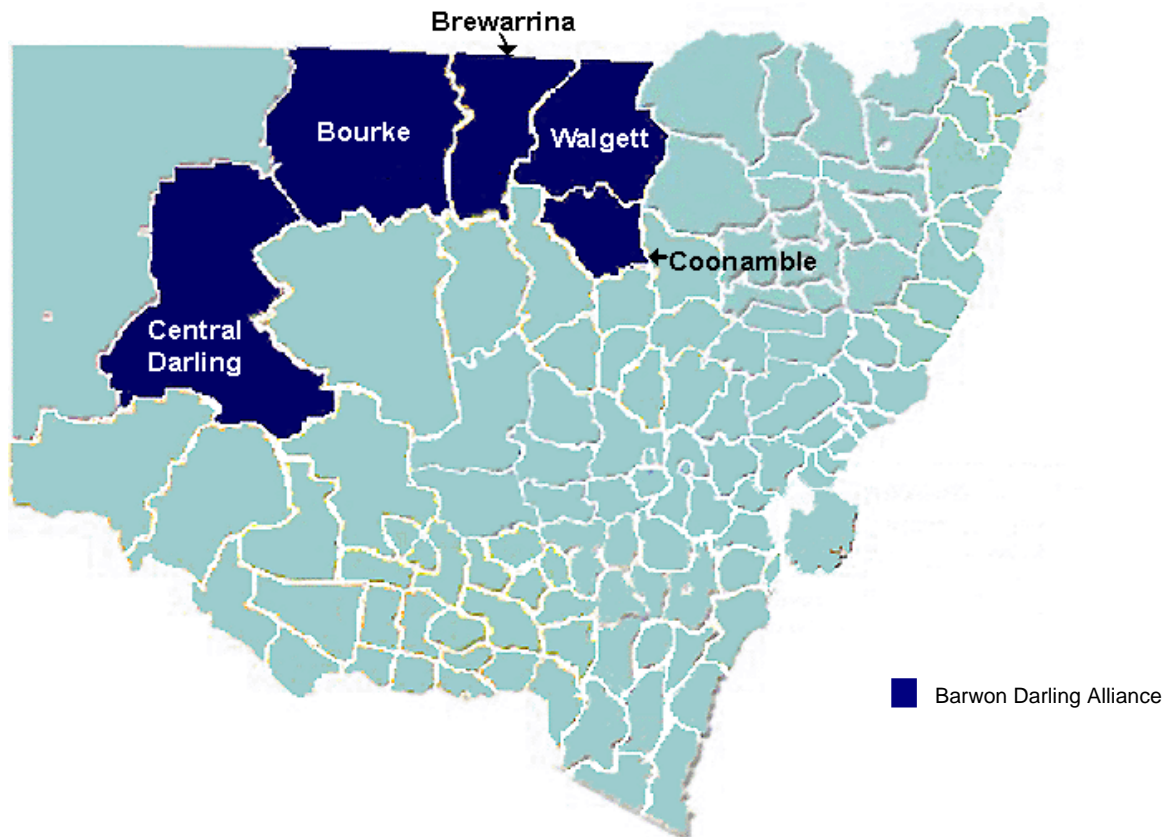
Methodology

2 METHODOLOGY

2.1 Socio-Economic Zone Index

The Socio-Economic Zone Index (SEZI) compares socio-economic factors in one geographic region to a benchmark area to determine disadvantage. In this report, the benchmark is New South Wales as a whole.

There are 10 socio-economic factors:

- unemployment;

- long term unemployment;

- Aboriginal and Torres Strait Islander unemployment;

- youth unemployment;

- employment growth;

- household income;

- poverty;

- qualifications;

- age; and

- gross regional product.

Each factor is compared between the Barwon Darling and NSW using the formula below:

$$\frac{\text{Barwon Darling Figure} - \text{NSW Figure}}{\text{NSW Figure}}$$

Where the difference between the Barwon Darling and NSW is greater than 25%, the region is ruled as disadvantaged in that socio-economic factor.

Each Barwon Darling region is assigned one SEZI point for each disadvantage ruling. These points are summed across the 10 factors to determine the level of disadvantage in each region, and the Barwon Darling overall.

2.2 Shift Share Analysis

Australian Bureau of Statistics employment figures were used to gauge growth or decline in these regions industries between the census years of 2001 and 2006. A shift-share analysis determined what portion of this growth or decline was as a result of:

- growth of the NSW economy;

- growth of each industry; and

- growth attributable to factors unique to the Barwon Darling.

A technical explanation of shift-share analysis is included in *Appendix 1: Shift-Share Methodology*.

2.3 Impact of Socio-Economic Zone Model

Australian Bureau of Statistics 2006 census data adjusted by Department of Education, Employment and Workplace Relations (DEEWR) 2007 employment data was used to create Input Output (IO) tables for the 5 individual LGAs, the Barwon Darling Alliance as a whole and NSW.

Analysis of the results allowed a comparison of Gross Regional Product (GRP), Household Income and Fulltime Equivalent Employment (FTE) with those of the 2003 report as well as a projection of impact should a socio-economic zone be created in the region today.

A detailed explanation of Input-Output methodology can be found in *Appendix 2: Input-Output Methodology*.

Socio-Economic

Zone Analysis

3   SOCIO-ECONOMIC ZONE INDEX

Walgett, Coonamble, Brewarrina, Central Darling and Bourke were compared with NSW in 10 key socio-economic areas. Each time a region was ruled as being disadvantaged, they received one Socio-Economic Zone Index (SEZI) point. Each region's individual performance for all 10 socio-economic indicators is included below.

3.1   Total Unemployment

The Australian Bureau of Statistics (ABS) defines unemployment as individuals who, during the week prior to interview night, did not have a job but were actively looking for work and were available to start work. The total unemployment rate shows the proportion of the labour force in each region that satisfies the ABS definition.

Table 3.1 below shows that unemployment in Brewarrina was most disproportionate to NSW, followed by the Central Darling. Apart from Coonamble, all regions and the whole Barwon Darling area, are ruled as disadvantaged and receive one SEZI point.

Table 3.1: Unemployment Rate Ranked by Region

Rank	Region	Total Unemployment Rate	Percentage Different to NSW
1	Brewarrina	14%	-198%
2	Central Darling	11%	-128%
3	Walgett	9%	-96%
4	Bourke	9%	-91%
5	Coonamble	5%	-13%
	Barwon Darling	9%	-105%
	NSW	4.60%	

Source: DEEWR 2008

3.2   Long Term Unemployment

Long-term unemployment shows the level of continuing unemployment in a region. Long-term unemployment is indicative of the structural, rather than cyclical, sources of unemployment.

Long-term unemployment statistics for LGAs were not available and thus an aggregated statistic was used for this comparison.

When compared to NSW as a whole, the Barwon Darling region is considered disadvantaged by long term unemployment rates, as shown in Table 3.2 below:

Table 3.2: Long Term Unemployment Rates Ranked by Region

Region	Long-term Unemployment Rate	Percentage Different to NSW
Northern, Far West-North Western and Central West Statistical Regions	24%	-33%
NSW	18%	

Source: ABS 2008

3.3 Aboriginal and Torres Strait Islander Unemployment

The Aboriginal and Torres Strait Islander (ATSI) unemployment rate shows the proportion of indigenous Australians that satisfy the ABS definition of unemployment. The unemployment rate has been calculated as total indigenous unemployment divided by the total indigenous labour force. This methodology differs from the 2003 report which calculated SEZI scores based upon total indigenous unemployment divided by the total labour force. This change was enacted to provide consistency in calculation across all SEZI indicators. For comparison purposes, 2003 indicators for Aboriginal and Torres Strait Islander unemployment were recalculated based upon this new methodology.

As shown in Table 3.3, ATSI unemployment is substantially higher in Bourke and the Central Darling than in NSW as a whole.

Table 3.3: ATSI Unemployment Rates Ranked by Region

Rank	Region	ATSI Unemployment Rate	Percentage Different to NSW
1	Bourke	25%	-30%
2	Central Darling	24%	-25%
3	Coonamble	22%	-15%
4	Walgett	21%	-12%
5	Brewarrina	21%	-11%
	Barwon Darling	23%	-19%
	NSW	19%	

Source: ABS 2006

3.4 Youth Unemployment

The rate of youth unemployment measures the proportion of the labour force aged between 15 and 25 who satisfy the ABS definition of unemployment.

Brewarrina, Bourke, Coonamble and Walgett were each ruled as disadvantaged under this socio-economic factor, as was the Barwon Darling region overall. The Central Darling recorded a youth unemployment rate slightly lower than the NSW average, and was not ruled as disadvantaged. The regional youth unemployment rates are compared with NSW in Table 3.4 below.

Table 3.4: Youth Unemployment Rates Ranked by Region

Rank	Region	Youth Unemployment Rate	Percentage Different to NSW
1	Brewarrina	23%	-100%
2	Bourke	17%	-46%
3	Coonamble	16%	-41%
4	Walgett	16%	-41%
5	Central Darling	11%	2%
	Barwon Darling	17%	-45%
	NSW	12%	

Source: ABS 2006

3.5   Employment Growth

Employment growth is indicative of economic growth in a region. Employment growth in the Barwon Darling regions was measured between the 2001 and 2006 Census'.

Overall, the Barwon Darling region experienced a significant decline in employment (Table 3.5). Each region is significantly disadvantaged when compared with the benchmark NSW, which recorded an increase in employment.

Table 3.5: Employment Growth Ranked by Region

Rank	Region	Employment Growth	Percentage Different to NSW
1	Central Darling	-30%	-638%
2	Bourke	-22%	-491%
3	Walgett	-16%	-384%
4	Brewarrina	-16%	-377%
5	Coonamble	-6%	-207%
	Barwon Darling	-18%	-419%
	NSW	6%	

3.6 Household Income

The median household income in a region indicates the general level of affluence in that region. On average, households in the Barwon Darling region received a weekly income of just over half of the income generally received by households in NSW. All Barwon Darling regions are ruled as disadvantaged by income except Bourke, as shown in Table 3.6 below:

Table 3.6: Household Income Ranked by Region

Rank	Region	Median Income	Percentage Different to NSW
1	Walgett	$ 581.60	-44%
2	Central Darling	$ 596.30	-42%
3	Coonamble	$ 677.30	-35%
4	Brewarrina	$ 712.90	-31%
5	Bourke	$ 820.60	-21%
	Barwon Darling	$ 677.74	-35%
	NSW	$ 1,036.00	

3.7 Poverty

The incidence of poverty in a region indicates the proportion of the population living below a prescribed poverty line. For the March quarter of 2008, the Melbourne Institute of Applied Economic and Social Research (2008) estimated the Henderson Poverty line to be $378.08, including housing, per week for individuals.

For the purposes of comparison with the 2006 ABS Census figures, the poverty line was rounded to $399.00. This means the proportion of people indicated to be under the poverty line may be slightly overstated.

Table 3.7 below shows that the Central Darling had the highest proportions of poverty while Walgett narrowly avoided being classed as disadvantaged in this indicator. The Barwon Darling region as a whole was not considered disadvantaged.

Table 3.7: Poverty Ranked by Region

Rank	Region	Percentage of Population in Poverty	Percentage Different to NSW
1	Central Darling	42%	-26%
2	Walgett	41%	-23%
3	Coonamble	38%	-15%
4	Brewarrina	37%	-11%
5	Bourke	31%	6%
	Barwon Darling	38%	-14%
	NSW	33%	

Source: ABS 2006

3.8 Qualifications

The proportion of qualifications in the population indicates the education level of the population and the general skill level of the workforce. Education has a strong influence on the quality of life of an individual, and is thus a prevalence indicator of disadvantage. Further, as labour market outcomes are partially determined by education, the level of qualifications in a region provides an at risk indicator of disadvantage.

All regions recorded a higher proportion of education than the NSW average, as shown in Table 3.8 below.

Table 3.8: Qualifications Ranked by Region

Rank	Region	Proportion of Qualifications per Capita	Percentage Different to NSW
1	Bourke	33%	19%
2	Walgett	33%	19%
3	Central Darling	31%	10%
4	Brewarrina	30%	7%
5	Coonamble	28%	1%
	Barwon Darling	31%	11%
	NSW	28%	

Source: ABS 2006

3.9 Age

The proportion of people in the population who are under 15 or over 65 years old provides an at risk measure of disadvantage.

Those over 65 years old are more likely than the average individual to live in poverty. People over 65 also require more medical services and other care services than the average population. Thus, the proportion of people over 65 in a region is indicative of a regions disadvantage. The proportion of people under 15 is also an indication of disadvantage, as households must pay for education and medical expenses. These expenses typically occur at a time in the life cycle when household earnings are low.

As shown in Table 3.9, none of the Barwon Darling regions were ruled as disadvantaged for their proportion of youth and elderly. Interestingly, the Central Darling returned a lower youth and elderly proportion than the benchmark NSW average.

Table 3.9: Proportion of Youth and Elderly Ranked by Region

Rank	Region	Percentage under 15 or over 65	Percentage Different to NSW
1	Coonamble	39%	-17%
2	Bourke	36%	-8%
3	Brewarrina	36%	-6%
4	Walgett	35%	-4%
5	Central Darling	32%	6%
	Barwon Darling	36%	-6%
	NSW	34%	

Source: ABS 2006

3.10 Gross Regional Product

Gross regional product (GRP) per capita provides a second measure of the general level of affluence in a region. GRP was estimated as the sum of industry value added for each region. Industry value added was calculated by multiplying industry employment levels in each region by the average value added per worker in each industry.

Overall, the Barwon Darling region experienced a decline in GRP per capita (Table 3.10). Each region is significantly disadvantaged when compared with the benchmark NSW figure, which recorded an increase in GRP per capita over the period.

Table 3.10: Gross Regional Product Per Capita Ranked by Region

Rank	Region	GRP per Capita	Percentage Different to NSW
1	Central Darling	$14,851.34	-69%
2	Brewarrina	$15,043.18	-68%
3	Walgett	$19,344.05	-59%
4	Coonamble	$20,461.47	-57%
5	Bourke	$21,236.37	-55%
	Barwon Darling	$19,822.47	-58%
	NSW	$47,442.33	

3.11 Total SEZI Scores

The total 2008 SEZI scores for each region compared with those of 2003 are shown below in Table 3.11.

Table 3.11: SEZI Score Ranked by Region

	2003 SEZI	2008 SEZI
Walgett	5	5
Coonamble	3	4
Brewarrina	5	5
Central Darling	6	6
Bourke	2	5
Barwon Darling Alliance	4	5

Walgett, Brewarrina and Central Darling have remained stable in terms of their respective SEZI scores between 2003 and 2008, with Walgett and Brewarrina scoring 5 SEZI points and Central Darling scoring 6. Coonamble has seen a slight decline moving from 3 to 4 SEZI points but is still not considered disadvantaged under the SEZI measure. The greatest shift however, has been in the Bourke LGA, which scored 5 SEZI points, up from 2 in 2003 to be reclassified as disadvantaged. As a whole, the Barwon Darling Alliance SEZI score increased by 1 meaning as a whole the region is considered to be disadvantaged.

4   SHIFT SHARE ANALYSIS

The growth and decline of 17 major industry sectors in the Barwon Darling was observed by comparing 2001 and 2006 ABS employment figures, as shown in *Table 4.1.*

Table 4.1: Industry Change 2001 - 2006, Number of Persons Employed.

	NSW Growth Component	Industrial Mix Component	Local Component	Total
Accommodation, Cafes and Restaurants	31.4	-15.0	-114.4	-98.0
Agriculture, Forestry & Fishing	193.2	-521.7	-255.6	-584.0
Communication Services	7.2	-19.0	-20.1	-32.0
Construction	26.9	42.9	-145.8	-76.0
Cultural and Recreation Services	6.8	-4.2	11.4	14.0
Education	55.4	46.2	-83.6	18.0
Electricity, Gas and Water Supply	3.2	4.5	24.3	32.0
Finance and Insurance	5.0	1.3	-17.4	-11.0
Government Administration and Defence	43.7	120.4	-261.2	-97.0
Health and Community Services	55.2	102.2	-74.4	83.0
Manufacturing	21.6	-19.5	-113.1	-111.0
Mining	10.9	39.3	-95.2	-45.0
Personal and Other Services	27.1	1.0	-82.1	-54.0
Property and Business Services	22.3	-0.8	-103.5	-82.0
Retail Trade	61.3	-14.0	-247.4	-200.0
Transport & Storage	14.8	5.4	-39.2	-19.0
Wholesale Trade	20.7	-63.5	-88.3	-131.0
Total	606.6	-294.2	-1705.4	-1393.0

Four of the 17 industries recorded a net increase in employment between 2001 and 2006.

- The greatest increase was recorded in the health and community services sector, followed by electricity, gas and water supplies, education, and cultural and recreational services.

- The greatest declines in employment occurred in agriculture, forestry and fisheries, followed by retail trade, wholesale trade and manufacturing.

Much of the decline that occurred in Barwon Darling industries between 2001 and 2006 can be attributed to local factors.

- The positive employment growth in the regional NSW economy as a whole is responsible for offsetting some of the growth negativity evident across the majority of industry sectors.

- Industry influences had a positive impact on 9 of the 17 industry sectors, particularly government administration and defence and health and community services.

- Factors specific to the Barwon Darling region had a negative impact on all industries except electricity, gas and water supply, and cultural and recreational services.

Overall, industry in the Barwon Darling is declining as a result of local factors, with agriculture, forestry and fishery, retail and wholesale trade, and manufacturing most affected. Electricity, gas and water supply and cultural and recreational services were the only industries to experience overall growth that occurred as a result of being located in the Barwon Darling region.

5 IMPACT OF SOCIO-ECONOMIC ZONE MODEL

An Input Output (IO) table was created for the Barwon Darling region based on updated 2006 census data inflated to 2007 values. This table was built to correspond to the 2000-01 table built for the original 2003 Barwon Darling Enterprise Zone report. This allowed a comparison to be made between the key economic indicators - gross regional product, household income and employment. A further detailed explanation of Input-Output methodology can be found in *Appendix 2: Input-Output Methodology.*

5.1 Assumptions Incorporated in the Input-Output Analysis

A number of assumptions derived from the 2003 Barwon Darling Alliance Impact study have been adapted in the construction of the IO tables so as to allow a degree of comparison to be made:

- In its report on enterprise zones, the National Institute for Economic and Industry Research (2001) estimated that the budget for a socio-economic zone could be about $5 million per annum. Inflated to account for CPI increase this figure would amount to $5.9 million in 2007 dollars. For the purposes of this analysis it is assumed that the budget for a Barwon Darling socio-economic zone could be a similar amount.

- Sixty percent of the socio-economic zone budget is made available for wage credits, with the remainder of the proposed budget being available to provide businesses with other incentives to reduce the cost of finance for expansion and assist new businesses establish or move into the area; as well as the administration of the trial. This means the funding available for wage credits is $3.5 million.

- Wage credits of 25 percent of total labour costs are provided to firms that increase their employment levels and for all employees of new businesses.

- The average labour costs of employees eligible for a wage credit is $ 33,581.02, which is the average figure for the compensation of employees (i.e. wages plus on-costs) in the Barwon Darling 2000-01 table constructed by the Western Research Institute, inflated by Australian Tax Office (ATO) income trends calculated for each LGA.

- Given total labour costs of $33,581.02 the average wage credit would be about $8,395.25 per eligible employee. With a budget of $3.5 million this means the employers of about 421 new workers could receive a wage credit.

- As such, socio-economic zone incentives are assumed to lead to the creation of 421 full-time equivalent jobs.

- The productivity and compensation of the 421 new employees is equal to the average per worker for the region, as determined by the Barwon Darling input-output model.

An input-output table for the Barwon Darling region was constructed using the Generation of Regional Input-Output Tables (GRIT) system and balanced using the RAS technique. Appendix 2 describes in detail how the Barwon Darling input-output table was constructed.

5.2 Economic Impact of Barwon Darling Region and Socio-Economic Zone

Table 5.1 demonstrates the possible economic impact of the Barwon Darling socio-economic zone model.

Table 5.1 Economic Impact of Barwon Darling Socio-Economic Zone (2006-07)

Economic Indicator	Barwon Darling Region (2006-07)	Economic Impact of Socio-Economic Zone
Gross Regional Product	$364 million	$26.2 million
Household Income	$196.1 million	$14.1 million
Employment (FTE)	5,839 jobs	421 jobs

In the current study, a socio-economic zone in the region could be expected to contribute some $26.2 million in gross regional product (GRP), $14.1 million in household income and 421 full-time equivalent jobs given the above assumptions. Given the estimated gross regional product in 2006-07 of $364 million, additional GRP of $26.2 million is equivalent to economic growth of 7.2 percent, an increase on the expected growth had the socio-economic zone been implemented in 2000-01 of 4.7 percent.

A comparison of results also demonstrates the fall in FTE employment between 2001 and 2007 has resulted in a corresponding fall in gross regional product and total household income over the same period. Considerable job losses occurred in agriculture, retail trade and manufacturing as shown in the shift share analysis of the region (Table 4.1), traditionally

low skill and low compensation industries. With the greatest losses occurring in the agricultural sector, an industry which has had to deal with significant drought and other natural factors since the original study, this has lead to the flow on in employment contraction across related industries and those that rely on household income. An increase in skilled labour, particularly in health, education and utilities, along with general average increases of compensation has resulted in increased average household incomes in 2006-07 compared to 2000-01.

In total, gross regional product has decreased by 39%, total household income by 22% and employment by 31% between the two periods.

Conclusion

6 CONCLUSION

The Socio-Economic Zone Index (SEZI) measure was reapplied to the individual Local Government Areas (LGAs) and the Barwon Darling region as a whole using updated 2006 census data. The SEZI score for the Barwon Darling region as a whole has risen indicating the region's disadvantage has increased since 2001 compared to the rest of NSW. The LGA of Bourke saw a considerable down turn over the period and has been reclassified under the SEZI score system as disadvantaged. This means all LGAs in the region apart from Coonamble are now considered disadvantaged compared to the NSW average.

Between 2001 and 2006, total employment fell by 1,393 jobs, a decline of 17%. Shift share analysis has indicated that a large part of this decline is a result of factors local to the Barwon Darling region and its economy.

Based on Input Output analysis, between 2000-01 and 2006-07 gross regional product has declined by some 39% while household income has fallen by 22%. This is predominately due to the drought and flow on effects from the subsequent contraction in the agricultural sector impacting on the social and economic structure of the region.

In summary, the Barwon Darling region, as in 2001, suffers considerable disadvantage when compared to the rest of NSW. In fact the disadvantage gap between the region and the rest of the state has widened considerably over the examined time period. A socio-economic zone is a tool which would likely help alleviate disadvantage in the region. Should a zone be established on a comparative scale to that suggested in the 2003 report, some 421 jobs are likely to be created. This positive impact would not be able to fully offset external negative factors in the region's economy, nor is it even likely to decrease disadvantage to 2001 levels. However such an initiative would make significant inroads into improving the welfare and social situation of the people of the Barwon Darling region.

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APPENDIX 1: SHIFT-SHARE METHODOLOGY

The shift-share methodology is useful as it provides some explanation of the past employment growth performance of a region. It is a mathematical technique that separates employment growth between state economy, industry mix and local components. In addition, shift-share analysis identifies industries that have grown at a faster rate than state and industry averages.

For each component of the shift-share analysis (state economy, industry mix and local) the result is either shown as a positive or negative change in employment.

- **State Economy** - The Barwon Darling region is part of the larger NSW economy is affected by state wide economic conditions such as changes in State government policy, levels of economic activity, and so on. It is therefore reasonable to expect that part of the employment growth in the region could be attributable to the overall growth of the NSW economy. This has been assessed as growth in the State regional economies i.e. excluding growth in the Sydney Statistical Division.

> Calculated as 2006 employment in the Barwon Darling region multiplied by the average regional employment growth for NSW.

- **Industry mix** - Industries grow at different rates to the average for the economy as a whole, growth may be rapid in some industries and slow or stable in others. Thus, the mix of industries in the Barwon darling region will affect the overall level of employment growth in the region.

> Calculated as the average growth of each industry at the combined regional state level less the average growth of regional NSW overall multiplied by 2006 employment in the Barwon Darling region.

- **Local component** - It could be expected that each industry in the Barwon Darling region will reflect the characteristics of that industry at the state level, however there will also be differences in the growth rates compared to the average rate of growth for that industry in regional NSW. Such differences can occur for a range of reasons, including: the competitive advantage of local industry; an attractive economic environment; access to resources and infrastructure; and so on. The local component of employment growth is attributable to the relative performance of firms in the region compared to the state average.

A positive local factor component for an industry indicates that firms from that industry in the Barwon Darling region performed better than the combined state average in that industry, in terms of employment growth. Conversely, if the Barwon Darling region

shows a negative local factor component for an industry, the firms in that industry are performing relatively poorly in comparison to the state average for that industry.

> Calculated as the growth of each industry in the Barwon Darling region less the average growth of each industry at the state level multiplied by 2006 employment in the Barwon Darling region.

Shift-share analysis, like all analytical techniques has some limitations. The main limitations of shift-share analysis include:

- it is based on ABS employment data which is defined place of residence not place of work, therefore the analysis may include individuals residing in the Barwon Darling region but working in other areas and vice versa;
- it does not offer a definitive explanation of why the various effects were positive or negative;
- in some cases the use of averages is not representative of the employment performance of individual industries or regions; and
- it may not be a reliable indicator of future employment performance.

APPENDIX 2: INPUT-OUTPUT METHODOLOGY

Input-output tables are part of the Australian national accounts. An input-output model provides a very detailed picture of the structure of an economy at a particular point in time. It includes all the transactions that occur during a specific period, usually one year.

- The rows of an input-output table show the disposal of the output of an industry to itself and to other industries as well as final demand categories (i.e. exports and household consumption); and

- The columns show the origin of inputs into production, whether they are intermediate inputs (i.e. intra- and inter-industry purchases) or primary inputs (i.e. labour and capital).

The main use of input-output tables is economic impact analysis, where the tables are used to estimate the benefits generated by new initiatives on each and every sector of an economy. For example, if there is a change in the purchasing or sales pattern of any industry, the flow-on, or multiplier, effects on upstream industries can be calculated. An input-output table is also very useful for estimating the direct and indirect contribution of a specific industry to the economy.

The application of input-output analysis to estimate the contribution of an industry to the economy involves four basic steps:

- Construction of appropriate national, state and regional input-output tables;

- Estimation of the value of the sales and purchases of the industry using surveys and secondary data sources;

- Insertion of separate sectors representing the economic activities of the industry; and

- Balancing of the input-output tables using the RAS method.

The input-output tables used in this study were constructed using the Generation of Regional Input-Output Tables (GRIT) system.

GRIT uses a series of non-survey steps to produce a prototype regional table from the national table, but provides the opportunity at various stages for the insertion of "superior data". The system is "variable interference" in that the analyst is able to determine the extent to which they interfere with the mechanical processes by introducing primary or other superior data.

The GRIT system is designed to produce regional tables that are:

- Consistent in accounting terms with each other and with the national table;

- Capable of calculations to a reasonable degree of holistic accuracy; and

- Capable of being updated with a minimum effort as new data becomes available.

The GRIT technique is basically a hybrid method of deriving state and regional input-output tables from the National input-output table while at the same time allowing for the insertion of superior data (i.e. information collected from surveys of individuals and organisations in the industry) at various stages in the construction of the tables. The GRIT procedure was developed by Associate Professor Guy West and Professor Rod Jensen of the University of Queensland and is the most widely used method of constructing input-output tables in Australia. The GRIT method is also widely used in America and Europe.

The final input-output tables were balanced using the RAS technique. The RAS technique is a bi-proportional iterative adjustment method designed to modify a base input-output matrix to fit new row and column totals. The rows and columns are simply adjusted proportionally to the new row and column totals in turn, and the cycle repeated until the actual row and column totals converge to the specified values. After the tables were balanced they were checked to ensure that the final tables were consistent and to identify any large discrepancies.

One of the main limitations of input-output tables is the assumption of linear coefficients. To address this problem and the associated problem of overestimation the input-output analysis undertaken for the Barwon Darling Alliance incorporates the marginal coefficients model.

The marginal income coefficients model attempts to overcome the limitations of traditional input-output analysis by removing the assumption of linear coefficients for the household sector. As is well documented in the literature, the household sector is the dominant component of multiplier effects in an input-output table so using marginal income coefficients for the household sector only provides a more accurate estimate of the multiplier effects and provides results closer to those of a computable general equilibrium (CGE) model. This should still result in a more accurate estimate of the significance of the industry value chain than would be possible with traditional input-output analysis.

Glossary of Terms

Capital Expenditure	Gross fixed capital expenditure is the purchases of durable investment goods such as dwellings, plant and equipment.
COE	Compensation of Employees (COE) is equal to the wages and salaries of employees plus on-costs (e.g. superannuation and payroll tax). Compensation of Employees is the basis of the *Household Income* multiplier.
Employment	Employment is measured as full-time equivalent (FTE) jobs.
Exports	At the national level exports are goods and services sold to non-residents. Note that non-residents are defined as consumers, firms and governments from outside a given area. To illustrate the difference, the sale of goods from the Barwon Darling Alliance region to a purchaser in Sydney is an export with respect to the Barwon Darling Alliance region input-output table, but is not classified as an export in the New South Wales input-output table.
Final Consumption	Final consumption expenditure includes the current expenditure of households, industry and government. It includes purchases of durable and non-durable commodities, except the purchase of dwellings and equipment that are capital in nature. There are two types of final consumption: private final consumption expenditure (PFCE) and government final consumption expenditure (GFCE).
Final Demand	Final demand is the demand for goods and services not used up during the production process. Final demand is the sum of household and government consumption expenditure, capital investment, exports and increases in inventories.
Intermediate Inputs	An intermediate input is a good or service that is used in the production process.
Imports	Imports are goods and services purchased from non-residents and may include: competing imports, where there is a domestically produced substitute; and complementary imports, where there is no domestically produced substitute. Note that non-residents are defined as consumers, firms and governments from outside a given area. To illustrate the difference, a purchase of equipment from Sydney by a Barwon Darling Alliance producer is an import with respect to the

Barwon Darling region input-output table, but is not classified as an import in the New South Wales input-output table.

GOS	Gross Operating Surplus (GOS) is the excess of gross output over the costs of production, before deducting depreciation, interest and company taxes.
Multiplier	A multiplier is a summary measure used for estimating the economic impact on an economy caused by a change in the demand for the output of a particular industry or group of industries. A multiplier indicates the relative magnitude of the flow-on effects of an industry compared to the direct effect of that industry.
	The multipliers in this report are for *output*, *value added*, *household income* (i.e. compensation of employees) and *employment*.
Output	Output is equal to total sales (i.e. quantity sold multiplied by price per unit).
Primary Inputs	A primary input is an input into the production process that is not a good or service. Examples of primary inputs are compensation of employees, gross operating surplus, imports and indirect taxes on products and production.
Value Added	Value-added is equal to the value of output minus the value of intermediate inputs. That is value added is the difference between the costs of production (excluding the Compensation of Employees, Gross Operating Surplus, Taxes and Imports) and the value of sales turnover. In a national accounts context, Gross Domestic Product (GDP) consists of the sum of value-added by all industries. Value-added also pertains to differences between the value of production at various stages of the supply chain.

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APPENDIX 3: FISCAL AND MARGINAL IMPACT

A3.1 Fiscal Impact

The fiscal impact of wage credits based on some realistic assumptions has been estimated below. In addition to those assumptions listed in section 5.1 and used to estimate the socio-economic zone budget and job creation, the assumptions underlying this estimate of the fiscal impact are as follows:

1. The annual Centrelink payment to an unemployed person is equal to $11,619.40. This is the Newstart payment, which was obtained from the Centrelink website, calculated as the average of the individual's status (single with or without children; or partnered). It is a conservative figure for unemployment benefits saved, although there would be higher savings for unemployed individuals and those working in Community Development and Employment Projects (CDEPs).

2. With on-costs of 15 percent and total labour costs of $33,581 derived from Australian Tax Office (ATO) data and the IO tables constructed by the Western Research Institute (WRI) the average wage for employees eligible for a wage credit is about $29,200. This figure represents the actual remuneration employees will be taxed upon. Given the tax rates for 2006-07 the income tax paid by new employees in the Barwon Darling socio-economic zone would be approximately $3,480 per year, which is equivalent to about 12 percent of their average earnings.

3. After tax, employees have a disposable income of about $25,720 per annum. New employees in a socio-economic zone have a marginal propensity to consume of 0.8. In other words the new employees consume 80 percent of the disposable income they receive above their previous Newstart payments. The Goods and Services Tax (GST) of 10 percent is applied to this additional consumption expenditure. Thus, the additional GST paid is $1,128 per annum.

4. Evidence from the United Kingdom suggests that 55 percent of the additional people employed in remote socio-economic zones (i.e. similar to the Barwon Darling) were previously unemployed. Thus, it will be assumed that unemployment benefits are saved for only half of the people who receive wage credits. Likewise, the additional income tax and GST benefits are only received for half of the new jobs created in the socio-economic zone.

Table A3.1 shows the fiscal impact of the Barwon Darling socio-economic zone on government expenditures and receipts, based on the assumptions outlined above. Given those assumptions, the Barwon Darling socio-economic zone would result in net expenditure for the state and federal governments of about $2.5 million per year. This estimate does not include extra funding commitments made as part of existing government programs.

Table A3.1   Fiscal Impact of Barwon Darling Socio-Economic Zone

Government Budget	Expenditures ($)	Receipts ($)
Barwon Darling socio-economic zone funding	5,900,000	
Additional income tax		732,540
Additional GST		237,469
Unemployment benefits saved	(2,445,884)	
Total	**3,454,116**	**970,009**
Net fiscal impact	**2,484,108**	

A3.2 Net Marginal Cost of Job Creation

Given the assumptions in A3.1 it is possible to estimate the net marginal cost of each job created in the Barwon Darling socio-economic zone. The net marginal cost is equal to the wage credit less the sum of additional income tax and GST plus the unemployment benefits saved.

Table A3.2 shows that the net marginal cost per job created in the Barwon Darling socio-economic zone is $281. In other words, once the 'fixed costs' (for example administration) of establishing the Barwon Darling socio-economic zone are incurred, it only costs $281 to create each job.

Table A3.2   Net Marginal Cost Per Job Created

Item	Amount
Wage Credit per Employee	$8,395
Less: Additional Income Tax	$1,740
Extra GST	$564
Unemployment Benefits Saved	$5,810
Net Marginal Cost per Job Created	**$281**

Net marginal cost per job is heavily reliant upon current government tax and welfare policy. As such, fluctuations in this value are common when examined over the long term. However at this point in time the net marginal cost per job created has remained remarkably constant when compared to 2003 with a rise of only one dollar per job created occurring.

THE WESTERN RESEARCH INSTITUTE

The WRI is a non-profit economic, business and social research organisation located on the Bathurst campus of Charles Sturt University. The WRI holds a wealth of knowledge on employment, business development and investment issues affecting regional Australia. It has worked with Commonwealth, State and Local Governments and industry groups on numerous investment and development programmes in regional areas. The WRI has strong credentials in business and commercial market consulting and applied economic modelling including input-output analysis, shift-share, agribusiness and regional socio-economic surveys and analysis.

The Research Team

WRI has built a dedicated team of professional research staff and associates with the expertise necessary to provide our clients with robust and reliable research solutions. All staff at WRI have extensive experience in data collection, analysis and reporting. WRI has a team approach to its projects and allocates work to members of the research staff as appropriate.

Tom Murphy Chief Executive Officer BEc. (Hons I) MSc. (Econ) Lancaster

Tom Murphy holds the degrees of Bachelor of Economics from the University of New England and Master of Science (Economics) from the University of Lancaster. He is currently Chief Executive Officer of the WRI. Mr Murphy has previously held academic positions as senior lecturer in Economics and Director of the Regional Economics Research Unit in the Faculty of Commerce, Charles Sturt University, Bathurst and positions at the University of New England and Macquarie University. He has also held the positions of Economic Analyst with the Office of National Assessments in Canberra, with responsibility for the ASEAN economies and Senior Consultant with KPMG Peat Marwick Management Consultants.

Kathy Sloan – Research Manager BAppSc (Geography) UC, GDip InfoSys CSU

Kathy is research manager of the WRI and is an experienced researcher in both the private and public sectors. Kathy provides project management across the WRI projects. Kathy's strengths lie in conducting community surveys, data analysis and information communication technology. Her experience in private consultancy and the Planning and Audit Division of CSU provides a strong background in project management and quality assurance.

Kathy Woolley – Business Development Officer BCom (Economics), Change Management Qualification (CMQ) (AGSM), Cert Public Participation (IAP[2])

Kathy has worked in the private and public sectors holding senior management positions for over 20 years. Her diverse career has included work within the media, events management, economics research, information management, retail and local government sectors. Kathy has an economics undergraduate degree and postgraduate qualifications in change management and public consultation. Having a background in project management assists Kathy in designing solutions that meet our customers' needs.

Lesley Arthur – Senior Research Officer BSc. Bio Sc (Hons), MSc Tech Ec**.**

Lesley is an experienced researcher in the areas of tourism, property development and economic development. Prior to joining WRI, Lesley was a director with KPMG Peat Marwick Management Consultants in Australia and Malaysia. Lesley is skilled in the construction and application of market forecasting and financial models and brings a wealth of experience to WRI projects.

Danielle Ranshaw – Senior Research Officer BEc&Fin NSW

Danielle's experience in project management in the information technology sector combined with qualifications economic and finance provide a solid background for WRI projects. Danielle recently joined the WRI after coordinating the Study Link program for Charles Sturt University. Danielle's skills in business and systems analysis, performance planning and review, and project planning make her a valued member of the WRI team.

Rachel Somerville – Research Officer BEquineBusMgt (Hons)

Rachel has experience in the hospitality and retail industries as well as having spent several years working as a sales representative for a local newspaper, developing a sound understanding of regional business. Rachel holds a Bachelor of Equine Business Management with second class, first division honours from the University of Sydney where she also listed on the Deans Honour List for Business Law.

Deborah Munns – Research Officer BA (Hons) USyd, Grad Dip Sec Ed (HSIE) CSU

Deborah has a Bachelor of Arts degree with Honours, majoring in Human Geography and Industrial Relations. Recently, Deborah obtained a Graduate Diploma in Secondary Education (HSIE). Deborah has a broad range of experience in the travel, retail and local government sectors. With experience in social research in both private consultancy and local government sectors, Deborah brings a variety of skills to support her position at the WRI.

David West – Research Officer BEcon, GCAppLaw UQ

David comes to the WRI having developed a range of skills in economic impact analysis, in particular Input Output (IO) modelling. Having worked previously for the Centre for Economic Policy Modelling at the University of Queensland, David has experience in modelling impacts from the LGA to national level and has worked on projects as diverse as non-profit festivals to major government infrastructure projects and billion dollar private sector investments and expansions both in Australia and abroad.

Dale Rogers – Research Assistant BA ANU

Dale commenced at the WRI as a fieldwork supervisor, and has worked on several community and business surveys. Dale also holds a Bachelor of Arts degree and majored in Anthropology and International Relations. Dale brings a high level of organisational skills and a vibrant personality to the WRI team.