

The Socio-economic Impact of the Australian Cotton Industry on Regional Communities in NSW and Queensland

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Information Paper

The Economic Structure of the Cotton Regions and the Economic Impact of the Cotton Industry

Report to the:

Cotton Catchment Communities CRC
Narrabri

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EXECUTIVE SUMMARY

This project is about the development and interpretation of a range of socio-economic indicators for a sample of case study communities where the cotton industry is a significant industry. This is one of the reports from this project and relates to the economic indicators and their interpretation.

Readily available economic indicators are mostly not available for regions in a form that is similar to those available for the states and the nation. As a result, the compilation of a set of indicators that describe the situation and trends in regional economies has to be fabricated from a variety of sources. The framework for the economic indicators is provided by the national accounts system and the embedded input-output tables. This work has been done in this study for five case study regions (Narrabri, Moree, Narromine, Warren in NSW and a defined region on the Darling Downs in Queensland) using the year 2005-06 data.

The economic indicators are used to support the formation and implementation of regional economic development strategies and projects, and the management of businesses in those regional economies. This is the smaller- scale equivalent of the use of national indicators for national economic policy. The limited amount of information available at the regional level is a major constraint on regional development efforts. Further, the situation is unlikely to improve and has in fact been worsened by the decision in the late 1990s to cease the production of annual estimates of the value of agriculture production for small regions such as LGAs. Agriculture is the dominant industry in these regions and a driver of the economy so information on the trends in that sector is critical to understanding the overall performance of the regional economy.

From this study it is proposed that economic information be compiled as follows;

- Each five years, prepare a set of data on the economy such as that prepared here based on the censuses of agriculture and population and other sources. These five-yearly sets of indicators provide the basis for periodic reviews of economic performance and development strategies (along with similar social indicators). The embedded input-output tables can also be a useful planning tool for estimating the economic impacts of new projects for the region.
- Within the local economy collect some key information that provides at least annual information on the performance of key parts of the regional economy or key industries that are the focus of the development strategy. Careful targeting is needed to keep the cost of that information manageable and it might be possible to enlist some support from the business community in the gathering of information that is also useful in business management.
- Consider the possibility of using new technology to fill the gap in data on the key agricultural industries. GIS technology and satellite imagery make it possible to compile timely information on likely agricultural

production. This task may be best achieved through groups of LGAs acting together to gain some economies and the access the required technical and industry skills that will be required.

Findings on the Case Study Regions

A summary of the findings from the analyses is shown in the table below. This shows the scope of the case study regions studied and the relative significance of the cotton industry to those regions. In interpreting these results, the aggregated nature of the Darling Downs region should be noted. Further, in most regions, 2005-06 was a relatively poor season for grain production while cotton was relatively near to average. As a result, the share of cotton growing in those economies is higher than the proverbial “average”. Since 2005-06, cotton crops have been much lower than shown as the drought impacts became severe and led to low irrigation water allocations in most regions.

Summary of Key Economy Measures

Measure	Narrabri	Moree	Narromine	Warren	Darling Downs
Gross Regional Product 2005-06 \$m	520	605	205	110	1,278
Employment – workplace 2006	5,350	5,691	2,159	1,105	14,450
Diversity Index	30.1	28.8	33.0	48.2	25.3
Cotton Growing Share of GRP (%)	19	29	11	22	6
Cotton Research Share of GRP (%)	1.7	0.3	-	-	0.04
Agriculture Share of GRP (%)	28.4	43.7	34.8	44.2	17.6

Some of the features of the case studies include:

- The regions varied in size by a factor of about 12.
- The smallest region economies were also the most remote, while the largest economy is the least remote.
- The diversity index is lowest (= most diverse economy) for the larger and least remote economies. However, even at 25, that indicates a relatively specialised economy.
- The share of cotton in the economy is largest in Moree and Warren as specialist agricultural economies, but is smaller for the more diversified economies (Narromine and Darling Downs). Narromine gains its status by way of its access to nearby Dubbo.

- The economic impact of cotton research is of negligible importance except for Narrabri.

The development opportunities for these regions vary considerably. Only the Darling Downs region has a record of steady growth (and even then it is mainly in the Dalby urban area). For the remaining regions, economic development to build industry and market diversity is a high priority.

In the case of Narrabri and the Darling Downs, there is the potential for some large energy developments with various projects already under way with more planned. The opportunities stem from access to coal and gas resources that can be mined and exported or used in locally based power generation and consumption. These developments will boost growth, although the capital intensive nature of these developments will limit the impact on the local economy. Some gains will be made in diversity but the primary industry base for those economies will remain with the associated implications.

All of the economies will make significant gains in diversity if they can build a larger share of their economies around knowledge and technology based industries, especially those that can service markets beyond the local region. There is accumulating evidence that it is small businesses (less than 20 employees) that create most jobs and are emerging as the focus of economic development strategies and projects. For the more remote regions, some more work needs to be done in making remoteness a valuable attribute. In Warren's case, consideration should also be given to ways in which the world class Macquarie Marshes can best be used commercially in ways that have been successful in Botswana.

Implications for Regional Development

Regional development is part of the policy and activities of all levels of government. The analyses of the case study economies indicate only slow improvement in overall growth and the development of a more diverse economic structure. It is appropriate to question why this is the case given the programs and resources that have been allocated under the regional development heading.

Regional development is about building the wealth of the community through the growth of economic activity and related activities. That growth can arise from a small number of broadly-defined sources, namely:

- Deriving additional value from the region's natural resources. This has been the basis for much of the development of the case study regions and for some, there are new opportunities related to coal and gas resources.
- Developing new businesses that are primarily based on technology, knowledge and human capital. This could be through expanding existing businesses or through the recruitment of businesses from elsewhere.

- In some cases, a locality may grow because of its proximity to a larger nearby centre that is growing with some of that growth spilling into a nearby centre.

The above opportunities for a region have to be turned into business activities. The focus has to be on business development (business creates wealth, governments redistribute wealth). To date, insufficient resources have been directed at realising the potential of existing businesses.

Research in the USA over the past decades is now providing some new insights into economic development. The focus has been on uncovering the sources of growth in economic activity in economies and communities of all sizes.

On the positive side, there is a growing recognition of the role of the entrepreneurial firm: or more particularly the entrepreneurial managers of those firms. The entrepreneurial firms are a small proportion of all businesses (less than 10 per cent), tend not to be industry specific, and span the range of business size and location. It is probable that a strong desire to innovate and grow the business is critical.

On the negative side, the branch operations of large businesses located in regional centres have a patchy record. They tend to be operated in ways that minimise costs as their main competitive weapon (relative to the niche marketing approach of smaller firms). The structure results in minimal management and other linkages within the local community where the branch is located.

The US work is suggesting that a number of changes could be made to the way the economic development part of regional development might be undertaken in these cotton communities (and regional Australia generally):

1. There needs to be a focus on business development led by entrepreneurial businesses with potential to grow and a passion to grow the business.
2. Less emphasis would be placed on business recruitment. However, some business recruitment will be necessary to build the industry value chains to enhance the region's existing and prospective industries.
3. There will be a restructuring of the staffing and work program of the regional development programs. More information will need to be gathered about the economic structure of the regional economy (such as in this report) and the businesses that comprise those industries.

All of these possibilities exist within the cotton regions to some degree. In the past, most of the development has been built around the natural resources of the regions. There has been some development of technology-based industries but for most regions it has been limited.

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1. INTRODUCTION

The scope of the Cotton Catchment Communities CRC extends beyond the cotton industry itself to include the communities where there is significant cotton production. A program of studies spanning many issues of a socio-economic nature is planned. This project is one of those projects with a basic objective of providing:

Detailed socio-economic analysis examining the impact of the cotton industry in key cotton growing regions.

In undertaking this work, the key milestones are:

- Detailed socio-economic analysis undertaken in key cotton growing communities benchmarking the impact of the cotton industry.
- Work with industry, LGA's and government agencies to assist them in understanding the implications of the socio-economic analysis and how this information can be integrated into (their) future strategic planning process.

In undertaking this project there is a number of tasks that are required to achieve the project outcomes.

- The development of a framework for the gathering, analysis and interpretation of the data;
- The gathering and analysis of the data;
- Consulting with relevant agencies and industry groups
- Reporting on the findings;
- Disseminating the findings to regional agencies and groups
- Providing recommendations the Cotton Catchment Communities CRC.

This report includes information on the following:

1. The key economic indicators and their development and interpretation in five case study regions.
2. The measurement of the economic impact of the cotton industry in five case study regions.
3. A comparison and discussion of the five case study regions.
4. A discussion of the regional development implications of the results for the five case study regions.

1.1 THE STRUCTURE AND ORGANISATION OF THE ECONOMIC ANALYSIS

The overall framework for the economic analysis is embodied in the national accounts. These are most prominent with respect to the Australian economy, but are equally valid at the regional level. The availability of appropriate data is what limits the application at the regional level. This is the consistent way to measure the level of economic activity in an economy.

The national accounts framework provides information on key attributes of the economy. These include:

Gross National Product (GNP) – the value of goods and services produced but excluding the multiple counting associated with inter-industry sales that occur if total sales are used. The GNP is essentially the value-added associated with the resources used in the business (labour and capital), and provides the income available to pay for those resources. Other information that is associated with the national accounts relates to external trade (imports and exports), household income and expenditure, capital expenditure and government consumption. These are the key tools used for macroeconomic management of the economy.

The regional equivalents would be useful in managing the region economy. However, there are no ABS estimates for regions smaller than the states and territories. To approximate those measures, it is necessary to derive them from a variety of data from the ABS and other sources. The framework in which this is done is the input-output tables.

Embodied in the national accounts structure is the input-output table (ABS Cat No 5216.0, Section 9). This requires that total supplies and total use are balanced for each industry. Thus, the input-output tables represent all production and consumption along with inter-industry trade and external trade that takes place in an (region) economy. In a developed economy, the inter-industry transactions are extensive and complex and are the subject of impact analyses that seek to identify and estimate the indirect effects of an industry or event.

This approach represents the required rigour to undertake the tasks outlined in the brief. It also provides a structure that can be applied consistently across regions and over time so that relevant comparisons can be made. The analyses reported here provide a benchmark that can be used in extending the analysis to other regions. They also can be used to compare the changes that occur in regions with the benchmark year of 2005-06.

The approach is also based on making use of existing data with no significant primary data collection. In recent years, the ABS has structured the collection of

economic data on a five-year cycle. That means this type of analysis can be completed best in those collection years with the most recent being 2005-06. That year included an agricultural census and the population census which are two critical inputs to the analysis of rural regions. This work has been undertaken over the 2007-08 period and even then, the ABS estimates of the value of agricultural production have not been available.

Most of the key economic indicators at the regional level have to be fabricated in some way as outlined above and requires some skills and experience. The main alternative is to use the quarterly labour market analysis that is derived from the labour force survey of around 30,000 households. These estimates are also fabricated and for small areas there is a significant sampling error that shows up in some quite large movements in the estimates from quarter to quarter (see Department of Education, Employment and Workplace Relations, *Small Area Labour Markets*, Canberra). However, over several quarters, the estimates are likely to indicate trends in employment.

A further alternative would be to gather some key data locally as indicators of trends in the local economy. These might include the development of series on retail sales from a sample of retailers, motor vehicle registrations, building approvals and visitor numbers. This information is likely to be most useful in identifying changes in the period between the main analyses every five years following the population and agricultural censuses.

The research was organised so that a pilot set of data were compiled for Narrabri. Those results were presented and discussed with representatives of various organisations and industry representatives in Narrabri to confirm the relevance of the approach. The approach was then extended to the Moree, Narromine and Warren LGAs in NSW and a region in Queensland that embodied part of the (previous) Dalby-Wambo, Millmerran and Jondaryan LGAs as specified in the brief.

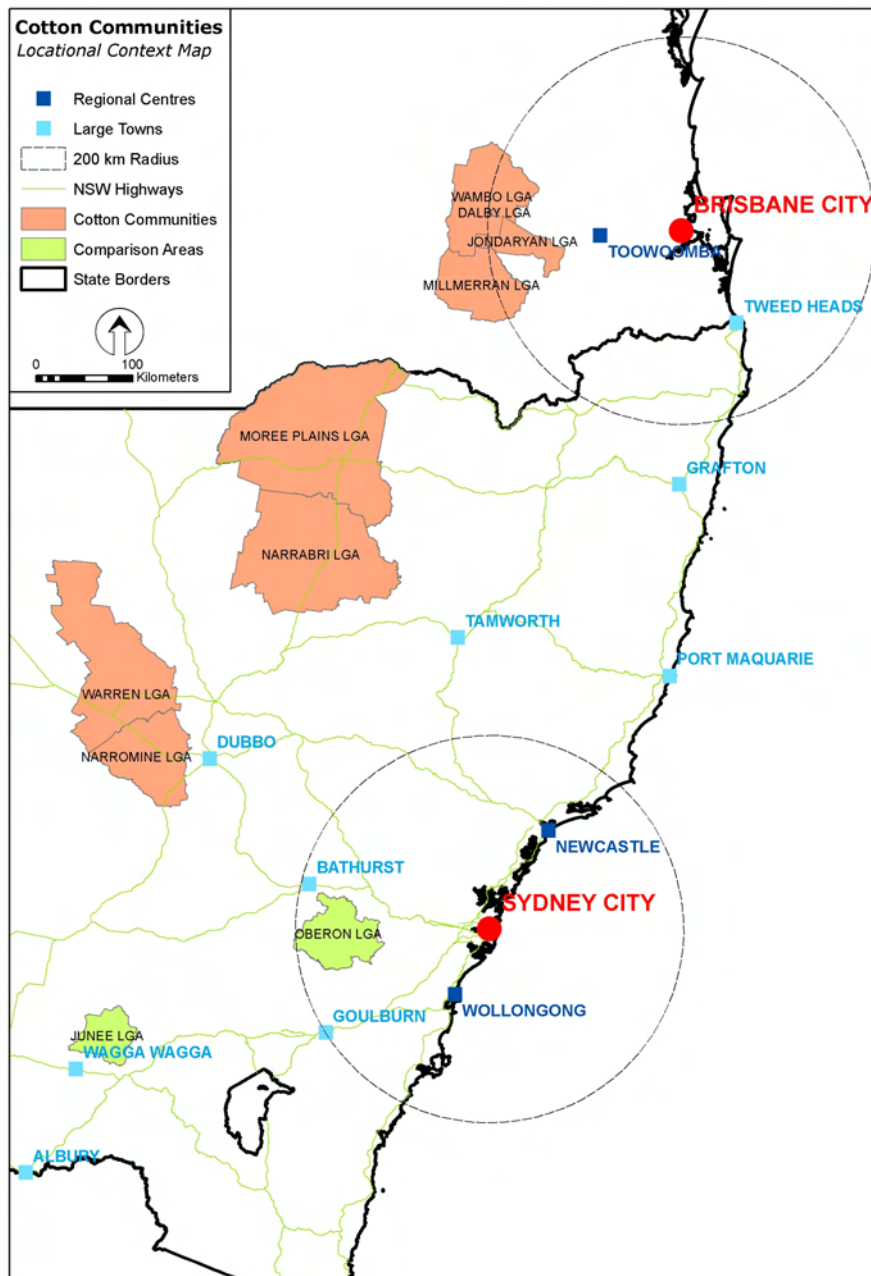
1.2 THE STRUCTURE OF THE REPORT

The material included in this report is structured around the case study regions as shown in Figure 1-1. In each section, the key indicators from the analysis of employment data are reported and commented on. The data are provided on a separate CD.

The input-output tables for each of the case study regions have been compiled using the approach outlined in the Attachments. The economic impact of cotton growing has been estimated by constructing a cotton industry sector in the table and then computing multipliers. The sector was constructed using information on cotton growing budgets derived from NSW Department of Primary Industry data

and other sources. In the case of the impact of cotton research, data was provided on the regional allocation of research management and research activity expenditure in the case study regions by the relevant organisations. The multipliers used in this case was that for “Technical, computer services” which covers scientific research.

Figure 1-1: Location of Study Regions



The work has been carried out on a case study basis and the results are presented for each of the case studies. The analysis is similar for each of the case studies. The analysis provides a large amount of data which will be made available to the relevant Councils. This report includes what is considered to be key measures that indicate important characteristics of the regional economies. That includes information on:

- Population and employment,
- The economy and its structure including diversity of industry structure,
- Recent development trends,
- Agricultural production,
- The cotton industry and its impact, and
- Summary comments on the direction of economic development.

The report is concluded with a summary discussion of the results including some comparative statistics. There are some comments on the implications from these analyses for the economic development of the various regions.

2. NARRABRI

Narrabri Shire is located in north-west NSW. The principal town is Narrabri with smaller centres including Wee Waa and Boggabri along with a number of villages. The region is notable for the quality of its natural resources, principally high quality cropping land, access to irrigation and an emerging supplier of energy products from coal and gas resources.

2.1 DEMOGRAPHIC CHARACTERISTICS

The Narrabri population has been steadily declining over the last two decades in common with most areas of inland Australia (Table 2-1). Employment recorded as either where they live (residence) or where they work (workplace) has also declined. In the period to 2006, drought will have had an impact that is difficult to assess. Thus those levels are likely to be abnormally low although the drought impact peaked after the 2005-06 year.

There is a significant amount of commuting across the shire boundaries. This reflects a range of job opportunities in nearby centres and the relationship of major projects like mining and construction to Shire boundaries. Those workers are travelling to jobs in many industries: services to agriculture, services to mining, construction, wholesale trade, retail trade, road transport, legal and accounting, other business services and community services. This indicates that Narrabri has some role as a residential centre for people working in a range of services that extend beyond the region. Perhaps, some of this is temporary and related to the drought effects that were significant in 2006.

Table 2-1: Population and Employment Summary, Narrabri

Census Year	Resident Population	Employment by Residence	Employment by Workplace	Net Commuting to Work
1981	16,000	6,845	na	na
1991	14,950	6,016	na	na
2001	13,930	6,141	5,787	354
2006	13,118	5,756	5,350	406

The Narrabri population is ageing (Figure 2-1). There is a higher proportion of the population in Narrabri in the age groups of 55 and above compared to the NSW average. Narrabri has a lower proportion of the population in the working age groups and is particularly deficient in the 20 to 40 age groups.

The number of males and females within the region is similar (Figure 2-2). However, there appears to be a higher loss of young males than young females from the region.

Figure 2-1: Age Profile, Narrabri 2006

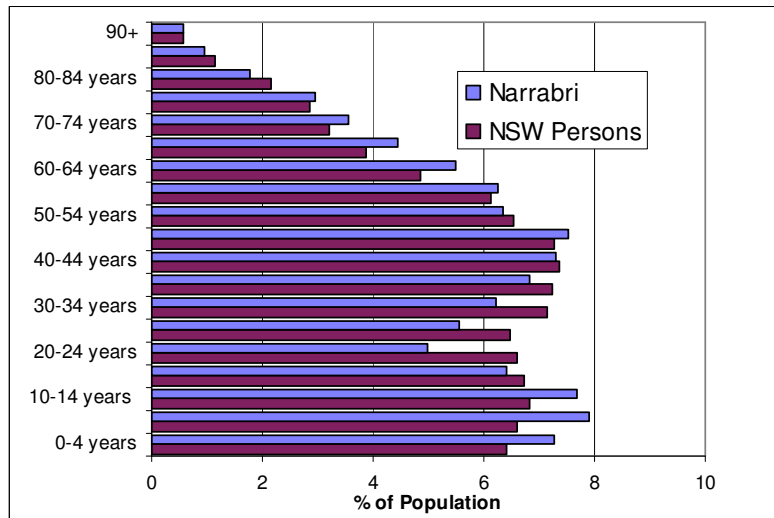
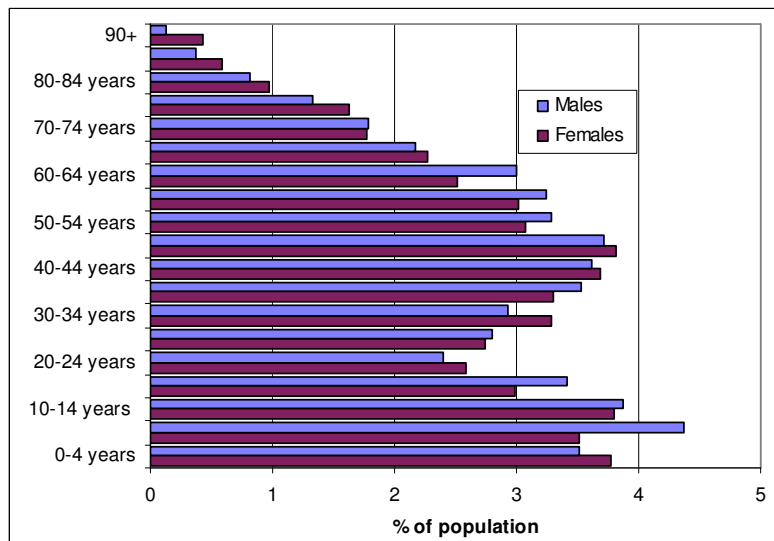


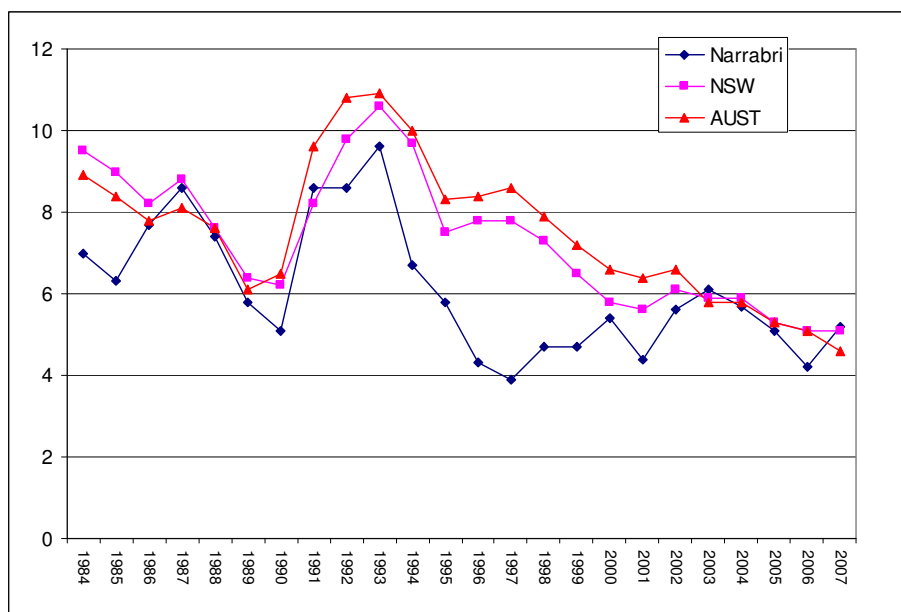
Figure 2-2: Age Profile by Sex, Narrabri 2006



2.2 UNEMPLOYMENT AND INCOME

Unemployment in Narrabri has been lower than the NSW and Australian level since the early 1990s (Figure 2-3). Some out-migration would have been part of this result, although most of those leaving would have been young people.

Figure 2-3: Unemployment, Narrabri



The composition of household income is indicated in Table 2-2. Narrabri households in 2001 had a disposable income 18 per cent below the NSW average. Relative to the NSW average, earnings from own unincorporated businesses and government benefits have higher shares, while the share of wages and salaries is lower. More recent comparable household income data are not available. It is likely that the level of income in 2005-06 is lower because of drought, but the composition would remain similar to that of 2001.

Table 2-2: Composition of Household Income, Narrabri

Income Source	Narrabri	Percentage	NSW	Percentage
Wages and Salary (\$m)	163.30	68	99,869	72
Own Unincorporated Business (\$m)	23.00	10	8,733	6
Investment (\$m)	18.00	8	12,121	9
Superannuation and Annuity (\$m)	3.00	1	2,962	2
Government cash benefits (\$m)	31.30	13	13,919	10
Other income (\$m)	0.40	0	1,203	1
Total income from all sources (\$m)	238.90	100	138,808	100
Net Tax (\$m)	45.10	19	31,389	23
Average weekly household Disposable Income (\$)	732.00		895.00	

2.3 ECONOMIC STRUCTURE AND TRENDS

The information in this section is built mainly on analysis of the detailed employment data collected every five years as part of the population census. Other data are taken from the input-output table for the region compiled for this project.

A summary of the key statistics for Narrabri Shire in 2005-06 is shown in Table 2-3. These are measures used in the national accounts applied at the regional level. The key features of these estimates are:

- The Gross Regional Product (GRP) at \$520m and so the GRP/capita are relatively low because of the effects of drought. While a precise estimate is difficult, it could be around 20 per cent below a normal level.
- Narrabri is a very 'open' economy with the level of exports representing a high share of GRP. The level of imports is also very high relative to GRP. Most consumer goods and the materials used in key industries such as agriculture are imported. These measures reflect the limited diversity of the Narrabri economy. Overall, imports exceed exports.

Table 2-3: Summary Measures of Narrabri Economy

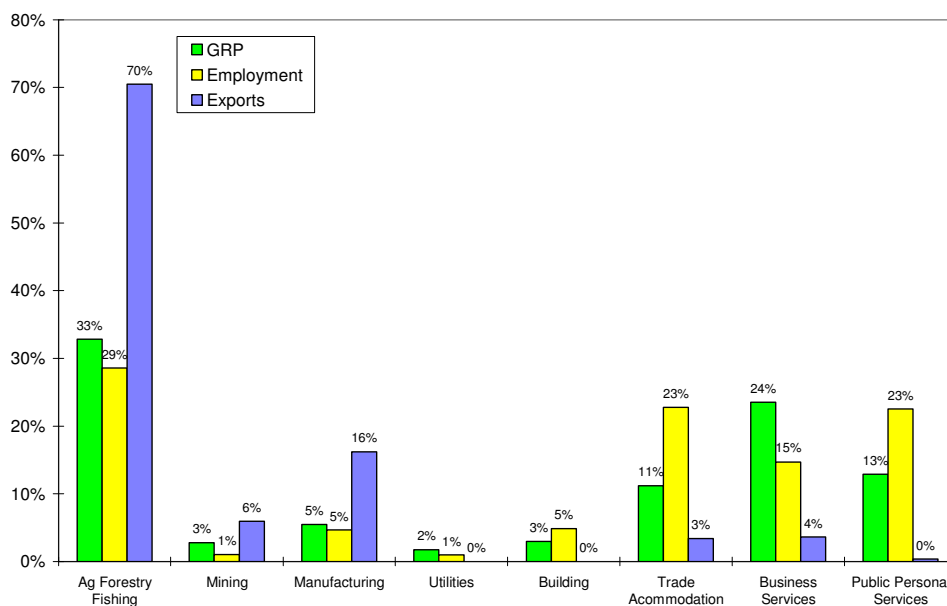
Regional Economy Measures: Narrabri	Value 2005-06
Gross Regional Product (\$mil)	520
Population 2006	13,118
GRP/capita \$	39,640
Exports \$m	423
Exports share of GRP %	81
Imports \$m	452
Imports share of GRP %	87
Trade Balance \$m	-29
Household Employment Earnings \$m	228
Household Expenditure \$m	397
Household Balance \$m	-169

- The earnings from employment are estimated to be \$228m, well below the level of expenditure (by \$169m). The difference will be made up from other sources of income including welfare payments, withdrawals from savings and superannuation, earnings from investments, the operating surpluses from owner-operated businesses and borrowings. The inclusion of an imputed value for owner-occupied dwellings adds to the level of

expenditure. The poor seasonal conditions would be exacerbating this deficiency.

A perspective of the structure of the economy is shown in Figure 2-4. This highlights the dominance of primary industries especially in exports. There are limited shares attributed to mining, manufacturing other than those associated with agriculture, utilities and building. Most of the other economic activity is associated with a full range of services with a notable strength in the business services category.

Figure 2-4: Industry Structure of the Narrabri Shire, 2006



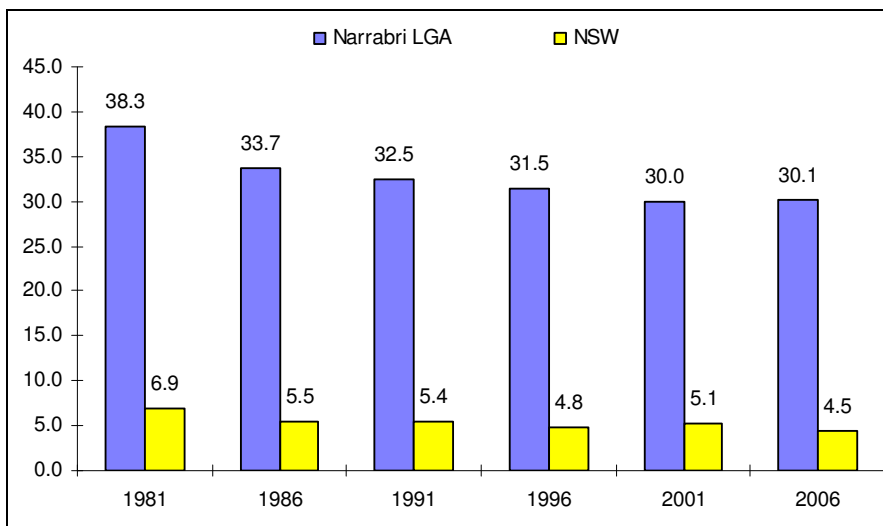
A time perspective is provided by the data in Table 2-4 (these data are employment by residence). These summary data show very little change in the industry structure of the Narrabri economy over the past decade.

Table 2-4: Industry Composition of Employment, Narrabri

	Employment (No.)			Employment (%)		
	1996	2001	2006	1996	2001	2006
Primary industry	1,704	1,788	1,593	29	29	28
Manufacturing	324	280	294	5	5	5
Utilities & building	396	379	364	7	6	6
Trade	1,354	1,550	1,319	23	25	23
Transports & communication	410	422	418	7	7	7
Business & financial services	467	561	510	8	9	9
Public sector services	248	171	212	4	3	4
Personal services	1,003	988	1,046	17	16	18
Total	5,907	6,141	5,756	100	100	100

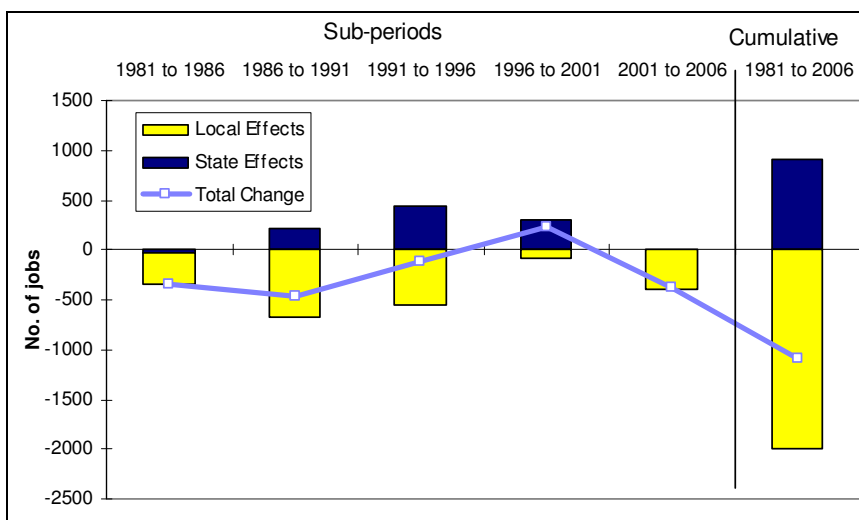
The implications from these data are the limited progress made toward a more diversified economy that is less exposed to the instability associated with primary production and commodity markets. The index shown in Figure 2-5 has shown only a small decline since 1986. (The index ranges from 100 for a one industry economy to 0 for the Australian economy.) This suggests that new efforts are needed to build more diversity into the economy.

Figure 2-5: Index of Specialisation, Narrabri



Second, with little or negative change in employment, economic growth is limited to that from rising productivity. While this has been relatively strong in agriculture, it is less so for the remaining industries. Thus, the result is that the growth in the Narrabri economy is lagging behind that of NSW and the nation. A summary of the shift-share analysis is shown in Figure 2-6.

Figure 2-6: Narrabri Growth Relative to NSW Growth



The shift-share analysis benchmarks Narrabri against the performance of the NSW economy. If Narrabri had kept pace with NSW, then over the 1981 to 2006 period, it would have about 1000 more employees (the dark blue segments). In reality, the change is shown as the “total change” and indicates a decline of 1089 jobs. Thus, over the 25 years, Narrabri has lost its share of the NSW economy by the equivalent of almost 2100 jobs (relative to present employment of about 6000). In 2006, Narrabri is around one-third smaller than it would have been if it had kept pace with the NSW economy. Finding new opportunities for growth is a high priority strategic issue and will mainly lie in non-agricultural industries and in areas where human capital is a key resource. New developments in energy (coal and gas) are occurring, but that should not lessen the search for new business opportunities.

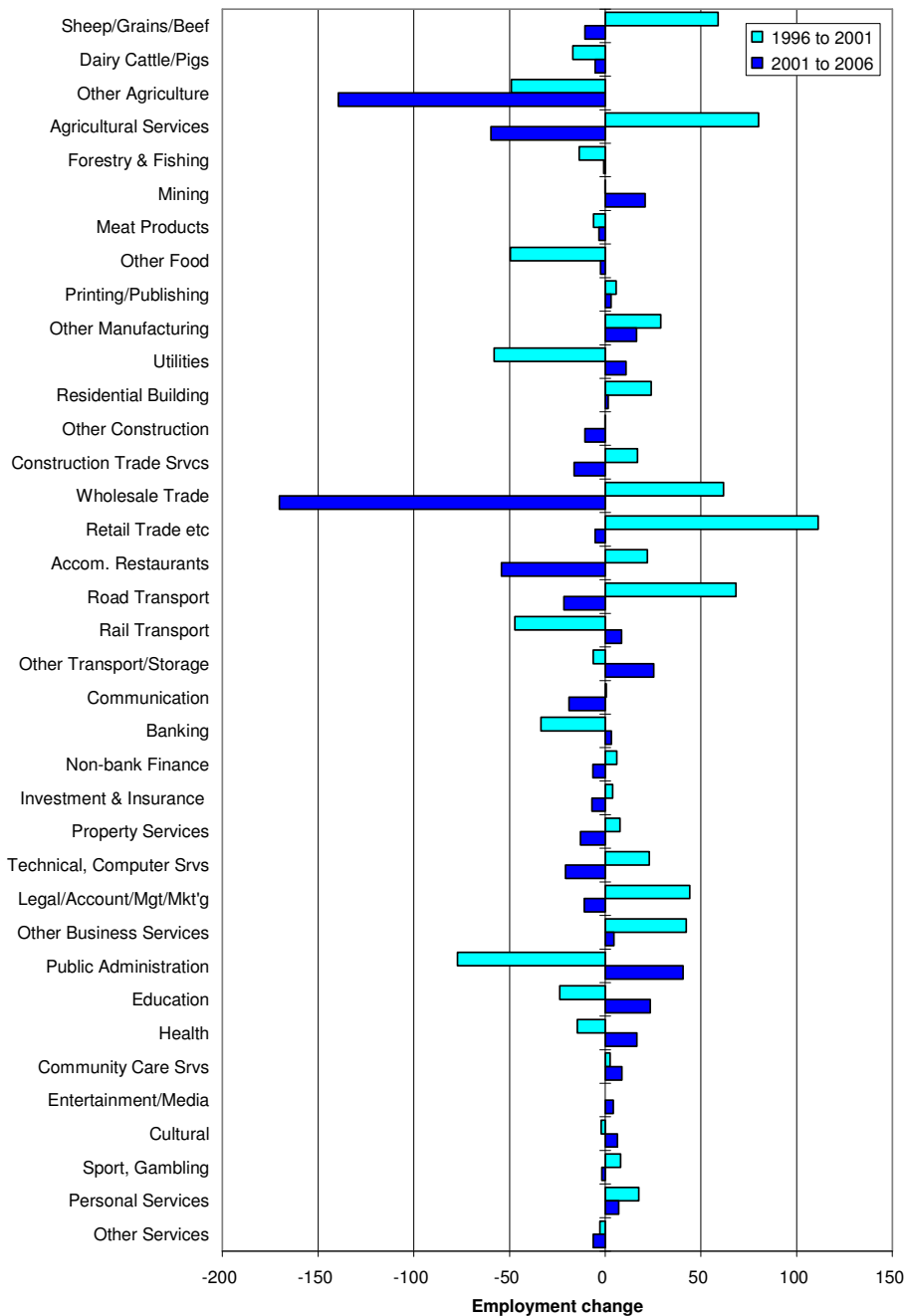
The analysis ranks industries in terms of their growth as indicated by the residence-based employment change over five years shown in Figure 2-7. The period 1996 to 2001 was one with overall growth in employment with a concentration in some areas of agriculture, trade, accommodation and technical business services reflecting a good business and household income situation. Those growth areas were offset to some degree by rationalisations in many areas of public sector activity and some agricultural and related processing activities.

The situation in the 2001 to 2006 period was dominated by poor seasonal conditions with widespread losses in employment in agriculture and related activities. This highlights the need for building diversity and robustness into the economy. There are signs of future growth potential in a number of areas including:

- Energy (coal and gas) and related activities such as electricity production;
- Machinery and other fabricated metal products for agriculture, mining and other users;
- Transport with the possible re-emergence of Narrabri as a hub (it was for rail some decades ago) possibly linked to an inland rail development;
- A resumption of growth in a range of advanced business services (research, marketing, legal, accountancy, etc); and
- As a regional hub providing a range of services including public administration, health and education to surrounding areas and providing services to visitors.

These are opportunities to build greater diversity into the Narrabri economy. A turnaround in agriculture and the development of energy resources may be the kick start in income growth, wealth creation and confidence needed for a broadly-based business development program.

Figure 2-7: Changes in Employment 1996 to 2006



Agricultural production is a key factor in the performance of the Narrabri economy. The value of production is indicated in Table 2-5 including some estimates for 2005-06 that may prove to be conservative. But they will be below the average level and are a factor in the slowdown in the Narrabri economy. This highlights not only the high dependence on agriculture, but a high level of specialisation within agriculture on cotton and wheat, although diversity is gained

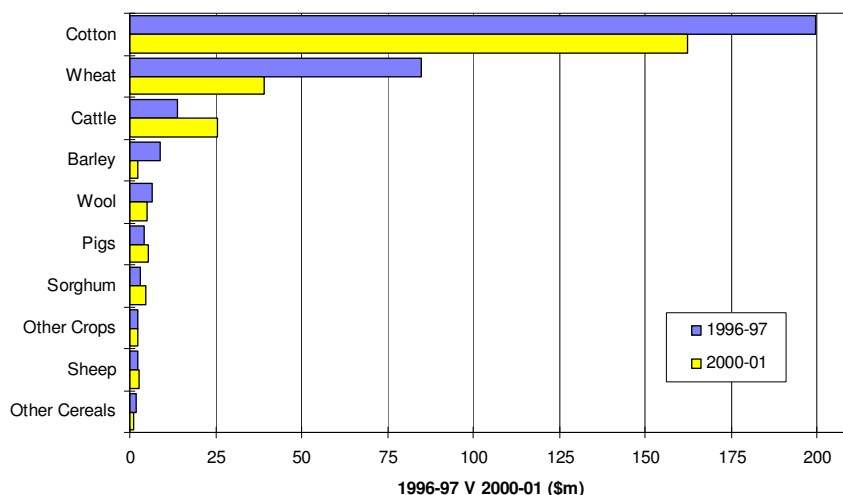
from the potential for both summer and winter cropping. Note that in 2000-01, there were considerable losses associated with early summer floods.

Table 2-5: Gross Value of Agricultural Production, Narrabri

Commodity	1996-97 \$m	2000-01 \$m	2005-06 \$m
Cotton	200	163	180
Wheat	85	39	75
Cattle	14	25	24
Barley	9	2	
Wool	6	5	
Pigs	4	6	
Sorghum	3	4	
Other Crops	2	2	11
Sheep	2	3	
Other Cereals	2	1	
Oilseeds	2	1	
Vegetables	1	1	
Milk	0	1	
Total	331	253	292

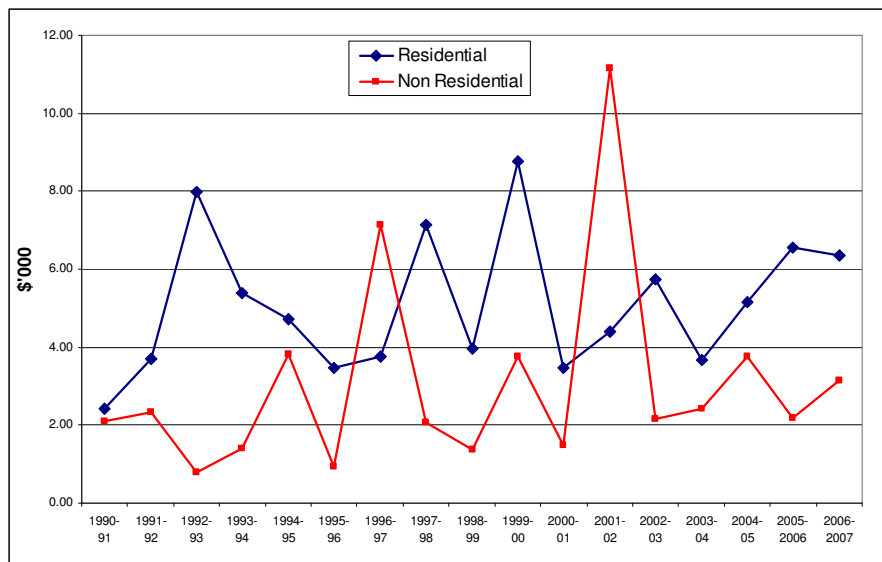
Note: 2005-06 estimates by CARE of the main categories and subject to revision

Figure 2-8: Gross Value of Agricultural Production



Building is an indicator of the strength and prospects for an economy. Residential construction is an indicator of population growth while non-residential construction is an indicator of the overall level of business investment. The annual approvals data are shown in Figure 2-9. The data show an increasing trend in both series up to the early 2000s but weakness since then as the drought conditions persisted.

Figure 2-9: Building Approvals, Narrabri

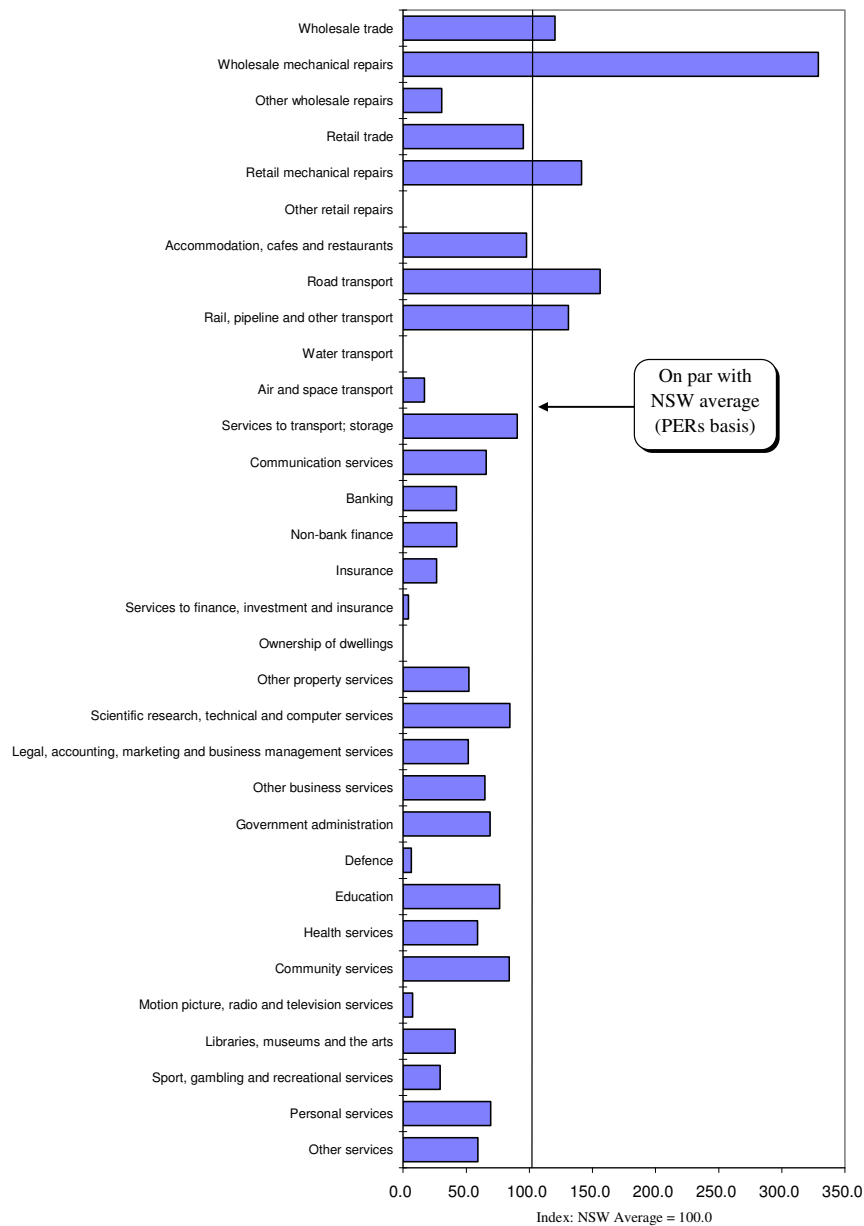


2.3.1 Service Delivery Levels

A benchmarking process for measuring the level of services in a region is to calculate for each industry the ratio between the population and the number employed in the particular service industry (known as a Population Employment Ratio – PER). For Narrabri, these are shown in Figure 2-10 for each of the main service industries as an index of the level relative to that for NSW as a whole. A value of 100 indicates parity with the NSW average.

Overall, the service level in Narrabri is about 80 per cent of the NSW level. This chart highlights a number of areas where Narrabri has a high level of service and prospectively, growth potential. These include wholesale trade, mechanical repairs, some areas of transport, and scientific and other specialised business support services (reflecting in part the key role of the cotton industry in this economy). Education, health and community care are notably below the average, and need to be reviewed in the context of Narrabri becoming a hub in the provision of these services.

Figure 2-10: Service Delivery Index 2006 Narrabri

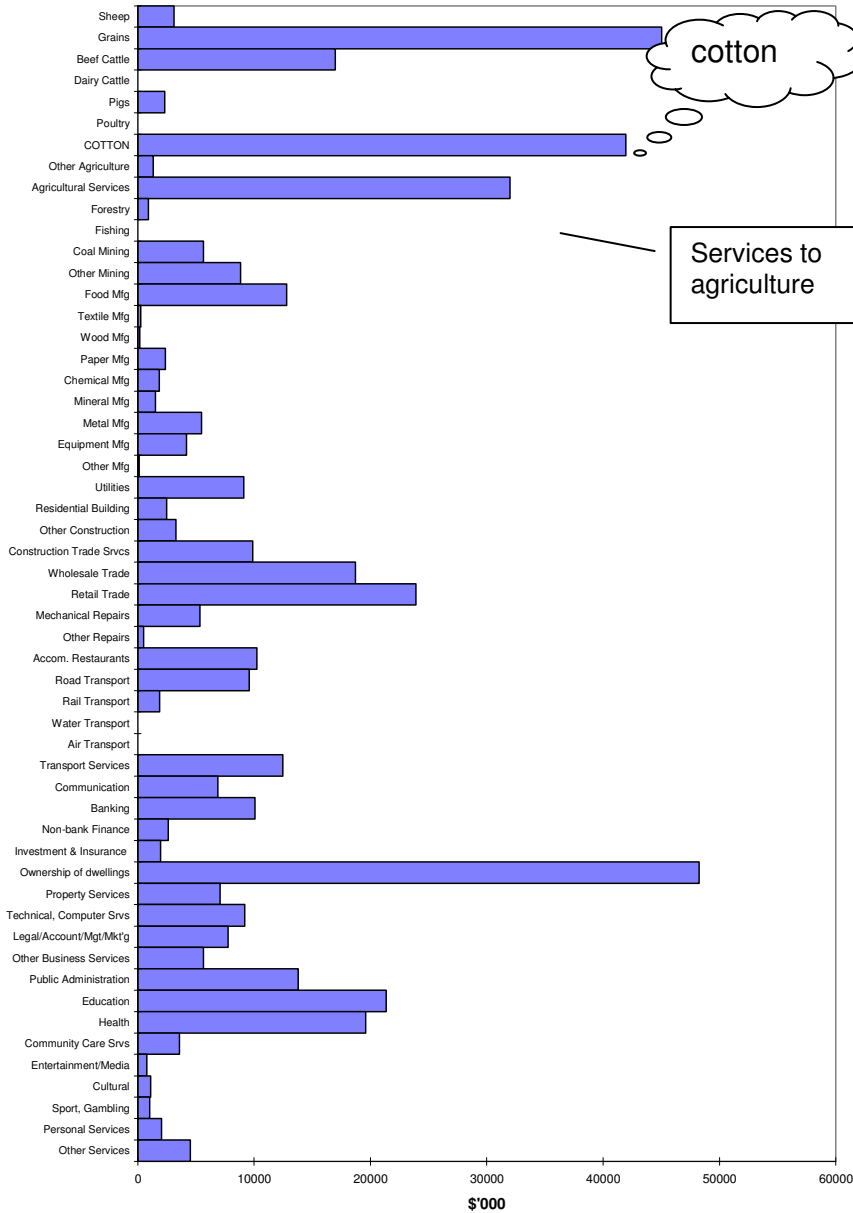


2.4 COTTON AND THE NARRABRI ECONOMY

The Narrabri economy is represented in the form of an input-output table. The table is a preliminary one given the current unavailability of the ABS data on the gross value of agricultural production. It provides a structure that can be used to compare economies over time in a consistent way. It is also used to derive multipliers that estimate the flow-on impacts associated with the cotton industry.

There are a number of ways to present some summaries of the information derived from the input-output table. In this case, a chart showing the industry contributions to GRP is shown in Figure 2-11. This is an aggregated version of information that includes 109 industries.

Figure 2-11: Industry Contributions to the Narrabri Economy



The features shown by this figure include:

- The rental value and imputed value of owner-operated housing is one of the largest contributors to GRP. Inclusion of these values is conventional to show the real economic value of the housing activities to residents.

- The dominance of the primary industries is apparent, even in a period when the value of agricultural production has been depressed because of drought. This table shows the cereal crops harvested in late 2005 and the cotton crop harvested in 2006. The latter was near to average, but conditions in mid-2006 were indicating poor winter crops and low water availability for the next irrigation season. As a result, the economy was already slowing rapidly by the end of the 2005-06 year (when the population census was taken).
- Services to agriculture is also an important industry that is closely linked to cotton as it includes a range of crop husbandry operations, contract harvesting and cotton ginning. Many of these activities were subsequently reduced with smaller cotton crops.
- The other key industries are those relating to trade and those with substantial public funding, education, health and community care.
- Although it does not stand out, there is a strong role for some of the business services that employ a high level of technical skills such as legal and accounting services and computing and research activities. These hardly exist in many regions but are an important strength in Narrabri.

2.5 THE ECONOMIC IMPACTS OF THE COTTON INDUSTRY

The analysis is shown in two parts: cotton growing and cotton research. The input-output model is used to calculate multipliers to estimate the flow-on effects. The multipliers for the two industries are shown in the Attachments to this section.

2.5.1 Cotton Growing

A summary of the impacts for cotton growing is provided in Table 2-6. These show the flow-on and total impact of cotton growing that had a gross output of \$180m. Directly, cotton growing generated value added of \$46m, employment of 344 people who received income from employment of \$14m.

The total impact resulted in estimates of value added of \$107m and 914 jobs earning \$43m for their households. The large flow-on effects is concentrated in the production category and is a reflection of the large amount of services that are purchased by growers from other specialists. This includes cotton ginning, consultants and contracted farm operations such as spraying. Relatively few impacts accrue from the purchase of materials as most of those are imported

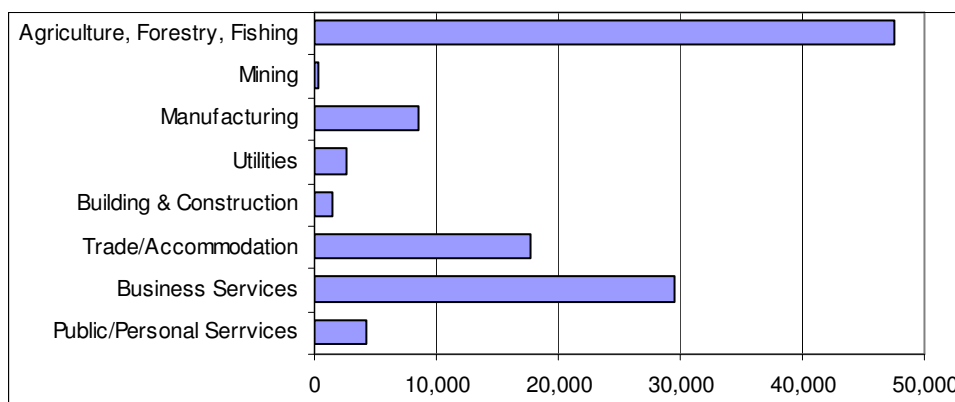
with local distribution margins accruing locally. The exception lies in the local supply of cotton seed.

Table 2-6: Narrabri, Cotton Growing Impacts

NARRABRI COTTON GROWING IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	180,390	94,317	25,781	120,098	300,488
Value-Added (\$'000)	46,200	45,539	15,443	60,982	107,182
Household Income (\$'000)	13786	23166	6355	29521	43307
Employment (no.)	344	405	166	570	914

The distribution of the flow-on impacts by broad industry groups is shown in Figure 2-12 (further industry details are included in the Attachments to this section). This highlights the heavy concentration on the agriculture services activities and the use of a range of business and trade services. There are few flow-ons to manufacturing from within the cotton industry itself, or via the consumption-induced effects. The latter is a reflection of the limited local production of manufactured consumer goods.

Figure 2-12: Distribution of Cotton Growing Flow-on Effects by Broad Sector (\$'000)



Relative to the Narrabri region, the total impact of cotton growing amounts to

- 29 percent of gross output
- 19 per cent of value added
- 17 per cent of employment and
- 17 per cent of household income from employment.

2.5.2 Cotton Research

A similar analysis has been prepared for the cotton research activities that occur in the Narrabri Shire. These involved a total expenditure in the region of \$9.9m in total. That included \$6.9m of Cotton CRC research operations and \$3.0m of research outside the Cotton CRC and the operating costs of the Cotton Research and Development Corporation that are incurred in Narrabri.

The results are shown in Table 2-7. In this case, the direct value of \$9.9m generates a total impact of \$18m in gross output, \$9m in value added and almost \$7m in household income for the 132 employees.

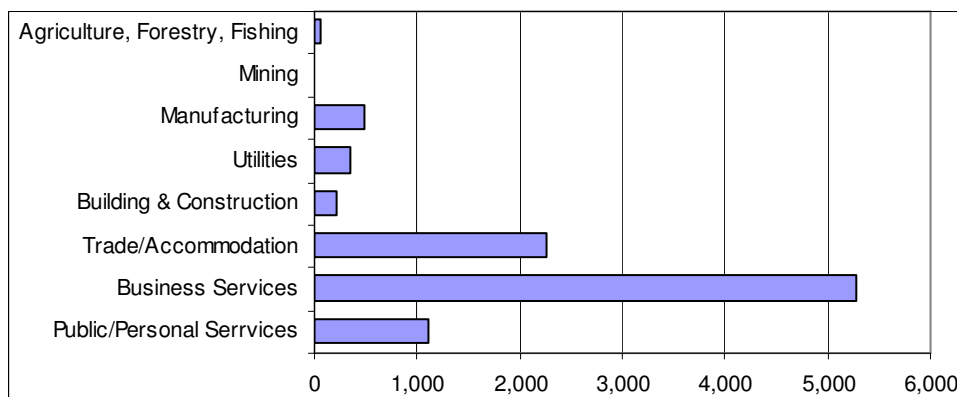
Table 2-7: Narrabri, Cotton Research Impacts

NARRABRI COTTON RESEARCH IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	11,866	4,882	4,880	9,763	21,629
Value-Added (\$'000)	5,787	2,367	2,923	5,291	11,078
Household Income (\$'000)	5329	1666	1203	2869	8198
Employment (no.)	86	31	31	62	149

Relative to the Narrabri region, the research activities amount to 1.7 per cent of the value added, but around 2.5 per cent for employment and household income from employment. Compared with cotton growing, the research activities have a much higher share of employment in the cost of their operations. As a result, these research activities have a higher share in employment and household income derived from employment than does cotton growing. It also means that the consumption-induced impacts are more important than they are in cotton growing. Consequently, the impacts are widely spread through the service industries in the economy. The low share of manufacturing is again apparent as it stems from the limited local manufacturing of consumer goods. That result is shown in Figure 2-13, where the largest flow-ons occur in the business services group of industries followed by trade and accommodation. A detailed listing of the main flow-ons to industries is shown in the Attachments to this section.

The Cotton Catchment Communities CRC represents 70 per cent of the above impacts, so in employment terms it is around 1.75 per cent of the Narrabri economy.

Figure 2-13: Distribution of Cotton Research Flow-on Effects by Broad Sector (\$'000)



2.6 SUMMARY

In our experience Narrabri has a high standing as an inland rural region economy. It features high productivity from a rich resource base that dominates the structure of the economy. That brings the risks of high specialisation, especially if the specialisation is in agriculture/primary production subject to both natural and commodity price risks.

The cotton industry is an important and integral part of the Narrabri economy. It contributes most through cotton growing (about 17 per cent), but it is the region that has done best in building a range of technology-based activities related to cotton research and development (about a further 3 per cent). This is a real strength of Narrabri, and provides a model to build further activities that are based on high levels of technology and gaining associated value from the relevance of those technologies and products in the world at large.

The analysis is benign with respect to the development of increased diversity in the economy and the development of knowledge-based (as distinct from natural resource based) industries. Narrabri has captured significant benefits from a substantial role in cotton research and development and the astronomy facilities which provide important scientific niches for the region. Comparable developments across a range of industries have not been sufficient to impact on the measures of diversity that are available. This represents the most important potential economic development issue for Narrabri.

At the same time, Narrabri is on the cusp of substantial development based on the energy resources of the region – with the full potential yet to be explored. This will bring considerable benefits to the Narrabri economy, increasing GRP, employment and household income. This provides the opportunity to develop a program to capture as many benefits for the local region as is possible. This will

involve building the capacity of local firms to grow and win contracts, seeking to turn the workforce into 'residents', and nurturing the involvement of the corporates in the overall development of the Narrabri economy.

The fact remains that corporate activities will not be local, many of the large capital components will be imported along with technology specialists and some of the workforce. The volatility of the primary/energy commodity markets will still exist. It is also likely to lead to a rise in employment rates and housing costs that will reduce the earnings of existing Narrabri businesses and raise living costs.

These developments will not remove the need to develop further the knowledge-intensive industries for Narrabri. It is these industries that help with reducing the volatility of the economy, develops links into markets beyond Narrabri and provides high skill and high earning jobs for Narrabri. It also expands the range and number of 'business management' opportunities and builds an entrepreneurial capacity that is rare in inland regions.

ATTACHMENTS

Multipliers

NARRABRI COTTON GROWING MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.523	0.143	0.666	1.666	1.666
Value-Added (\$)	0.256	0.252	0.086	0.338	0.594	2.320
Household Income (\$)	0.076	0.128	0.035	0.164	0.240	3.141
Employment (no./\$m)	1.9	2.2	0.9	3.2	5.1	2.658

NARRABRI COTTON RESEARCH MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.411	0.411	0.823	1.823	1.823
Value-Added (\$)	0.488	0.199	0.246	0.446	0.934	1.914
Household Income (\$)	0.449	0.140	0.101	0.242	0.691	1.538
Employment (no./\$m)	7.3	2.6	2.6	5.3	12.5	1.722

Impact Distribution Ranked by Industry: Narrabri Cotton Growing

Narrabri Cotton Growing Industry: Output Flow-on Impacts	Ranked Flow-on	
	\$'000	%
Services to agriculture; hunting and trapping	46,768	41.8
Road transport	7,197	6.4
Wholesale trade	7,075	6.3
Ownership of dwellings	6,228	5.6
Retail trade	5,705	5.1
Basic chemicals	3,469	3.1
Scientific research, technical and computer services	2,834	2.5
Legal, accounting, marketing and business management services	2,736	2.4
Accommodation, cafes and restaurants	2,545	2.3
Banking	2,474	2.2
Other property services	2,430	2.2
Agricultural, mining, construction and lifting machinery	2,383	2.1
Retail mechanical repairs	1,946	1.7
Electricity supply	1,700	1.5
Communication services	1,663	1.5
Services to transport; storage	1,259	1.1
Education	1,238	1.1
Other business services	1,105	1.0
Health services	984	0.9
Construction trade services	902	0.8

Impact Distribution Ranked by Industry: Narrabri Cotton Research

Narrabri Cotton Research: Output Flow-on Impacts	Ranked Flow-on	
Sector	\$'000 %	
Scientific research, technical and computer services	1,531	15.7
Ownership of dwellings	1,179	12.1
Retail trade	932	9.5
Legal, accounting, marketing and business management services	616	6.3
Accommodation, cafes and restaurants	556	5.7
Other business services	504	5.2
Wholesale trade	464	4.8
Education	336	3.4
Other property services	307	3.1
Banking	281	2.9
Electricity supply	235	2.4
Services to transport; storage	223	2.3
Retail mechanical repairs	211	2.2
Communication services	206	2.1
Publishing; recorded media and publishing	186	1.9
Road transport	185	1.9
Health services	172	1.8
Government administration	165	1.7
Motion picture, radio and television services	140	1.4
Construction trade services	139	1.4

3. MOREE PLAINS

Moree Plains is recognised as the pre-eminent agricultural shire in Australia. The shire spans a large area, has rich soils and both summer and winter cropping opportunities. Irrigators have access to water from both the Gwydir and McIntyre River systems. Agricultural productivity is high and the shire has limited industry diversity beyond those related to agriculture and its support activities.

Moree is the main centre for the Shire. There are a number of smaller centres including Boggabilla in the north although most of the commercial links in the north are with Goondiwindi in Queensland.

3.1 DEMOGRAPHIC CHARACTERISTICS

The Moree population has been steadily declining over the last two decades in common with most areas of inland Australia (Table 3-1). Employment recorded as either where they live (residence) or where they work (workplace) has also declined. In the period to 2006, drought will have had an impact that is difficult to assess. Thus those levels for 2006 are likely to be abnormally low.

In recent times, there has been an increasing amount of commuting across the shire boundaries with a rising net commuting out to other places. Those workers are travelling to jobs in many industries: beef cattle, grains, residential building, construction trades, retail trade, legal and accounting and other business services. There were no industries with significant commuting in. It is possible that some of this is normal around the Shire boundaries. Some of the growth in 2006 may be temporary and related to the drought effects that were significant in 2006 and subsequently got worse.

Table 3-1: Population and Employment Summary, Moree

Census Year	Resident Population	Employment by Residence	Employment by Workplace	Net Commuting to Work
1981	17,250	7,335	na	na
1991	16,750	7,187	na	na
2001	15,458	6,902	6,811	91
2006	13,975	6,092	5,691	401

The age profile of the Moree population is similar to that of NSW (Figure 3-1). There are three notable features:

- The birth rate in Moree is greater than the NSW average with a higher proportion of the population within the 0-14 year age group.
- Unlike other rural NSW and cotton communities Moree has a strong working population with a high number of people in the 25 – 40 year old age groups. The main deficiency relative to NSW is in the 15 to 24 year age groups.
- The number of males in Moree exceeds the number of females in most age groups. This may be attributed to an industry structure that favours male employment.

Figure 3-1: Age Profile, Moree 2006

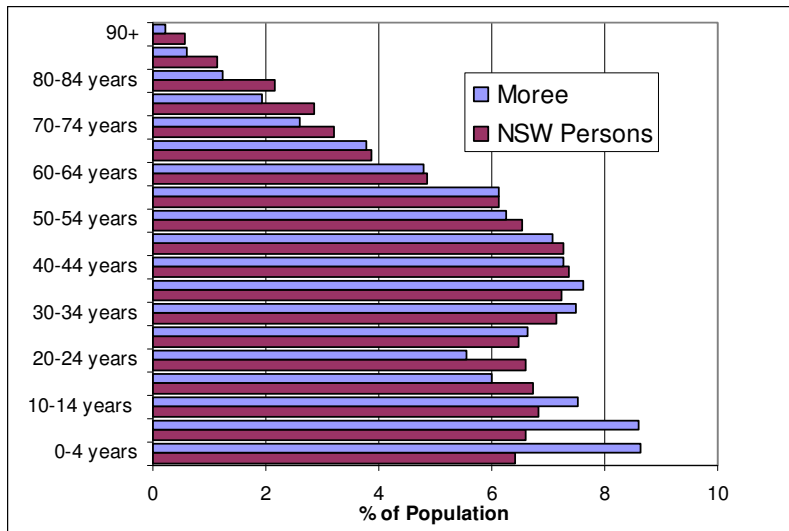
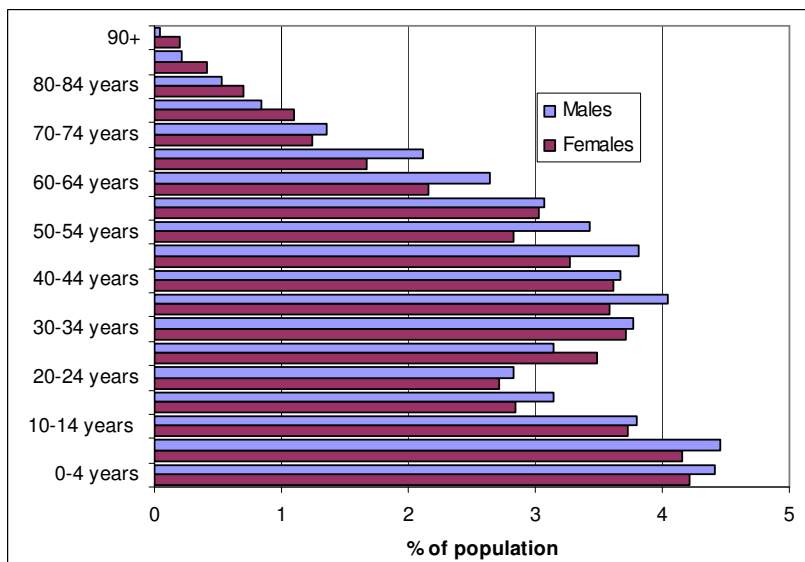


Figure 3-2: Age Profile by Sex, Moree 2006



3.2 UNEMPLOYMENT AND INCOME

Unemployment in Moree has been similar to or higher than the NSW and Australian level for the past decades (Figure 3-3). There have also been some large fluctuations in the rate of unemployment that reflects the large variations that occur in seasonal and economic conditions, eg., the severe drought effects in mid 1990s and in the mid 2000s.

Figure 3-3: Unemployment, Moree

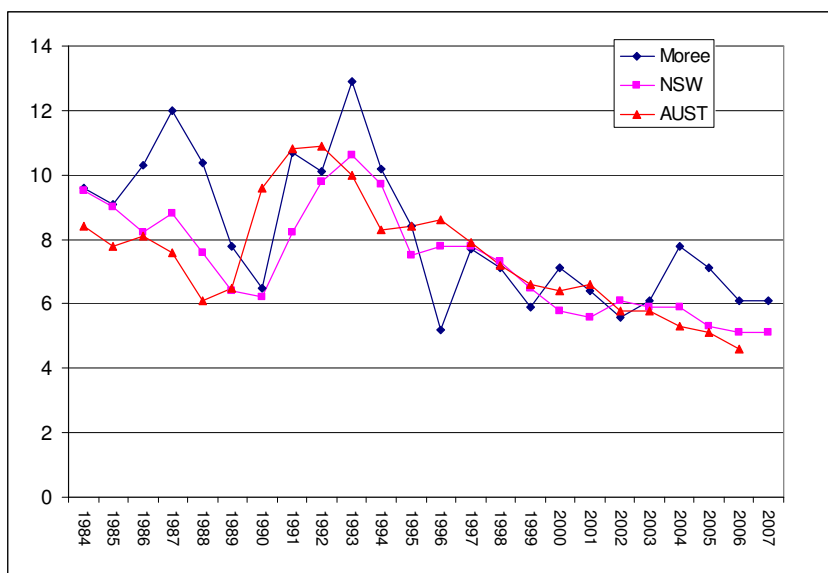


Table 3-2: Composition of Household Income, Moree

Income Source	Moree	Percentage	NSW	Percentage
Wages and Salary (\$m)	178.70	67	99,869	72
Own Unincorporated Business (\$m)	22.50	8	8,733	6
Investment (\$m)	29.10	11	12,121	9
Superannuation and Annuity (\$m)	1.70	1	2,962	2
Government cash benefits (\$m)	34.30	13	13,919	10
Other income (\$m)	0.80	0	1,203	1
Total income from all sources (\$m)	267.10	100	138,808	100
Net Tax (\$m)	54.80	21	31,389	23
Average weekly household Disposable Income (\$)	747.00		895.00	

Moree households in 2001 had a disposable income 17 per cent below the NSW average (Table 3-2). Relative to the NSW average, earnings from own unincorporated businesses, investment and government benefits have higher shares, while the share of wages and salaries is lower. Unfortunately, more recent comparable household income data are not available. It is likely that the



level of income is lower in 2005-06 because of drought, but the composition would remain similar to that of 2001.

3.3 ECONOMIC STRUCTURE AND TRENDS

The information in this section is built mainly on analysis of the detailed employment data collected every five years as part of the population census. Other data are taken from the input-output table for the region compiled for this project.

A summary of the key statistics for Moree in 2005-06 is shown in Table 3-3. These are measures used in the national accounts applied at the regional level.

Table 3-3: Summary Measures of Moree Economy

Regional Economy Measures: Moree	Value 2005-06
Gross Regional Product \$m	605
Population 2006	13,975
GRP/capita \$	43,291
Exports \$m	494
Exports share of GRP %	82
Imports \$m	436
Imports share of GRP %	72
Trade Balance \$m	59
Household Employment Earnings \$m	253
Household Expenditure \$m	423
Household Balance \$m	-169

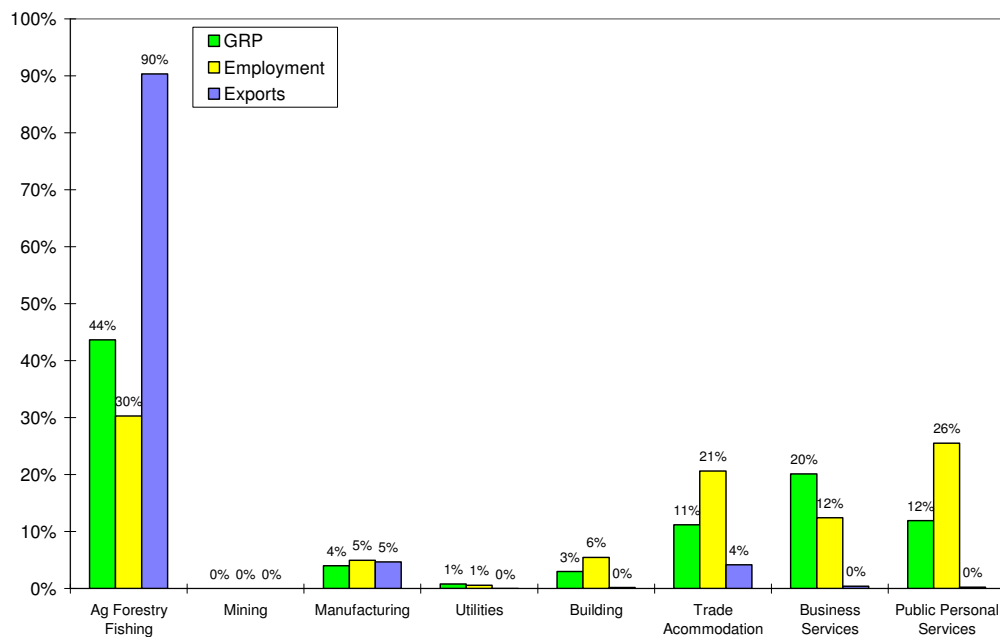
The key features of these estimates are;

- The GRP at \$605m and the GRP/capita are relatively low because of the effects of drought. While a precise estimate is difficult, it could be around 20-30 per cent below a normal level. However, worse conditions were to come in the next two years when agricultural production was reduced substantially.
- Moree is a very 'open' economy with the level of exports representing a high share of GRP. The level of imports is also very high level relative to GRP. Most consumer goods and the materials used in key industries such as agriculture are mainly imported. These measures reflect the limited diversity of the Moree economy. Overall exports exceed imports, but normally this is a much larger amount.

- The earnings from employment are estimated to be \$253m, well below the level of household expenditure (by (\$169m). The difference will be made up from other sources of income including welfare payments, withdrawals from savings and superannuation, earnings from investments, the operating surpluses from owner-operated businesses and borrowings. The inclusion of an imputed value of owner occupied dwellings in expenditure boosts the expenditure estimate. The poor seasonal conditions would be exacerbating this deficiency.

A perspective of the structure of the economy is shown in Figure 3-4. This highlights the dominance of primary industries especially in exports. There are limited shares attributed to mining, manufacturing other than those associated with agriculture, utilities and building. Most of the other economic activity is associated with a full range of services with a notable strength in the business services category.

Figure 3-4: Industry Structure of the Moree Economy, 2006



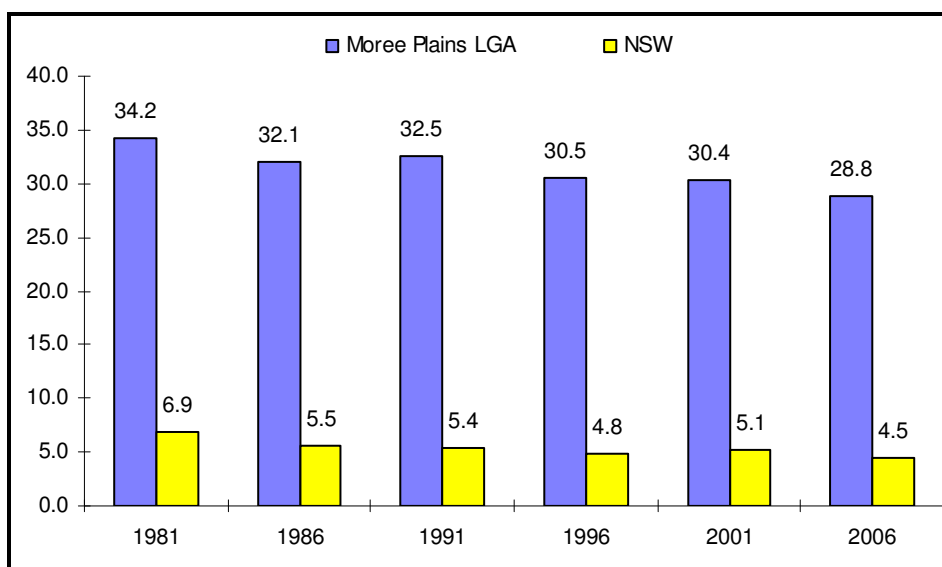
A time perspective is provided by the data in Table 3-4 (these data are employment by residence). These summary data show very little change in the overall structure of the Moree economy over the last decade. There is a tendency for primary industry to a declining share with some of the service industries rising slightly.

Table 3-4: Industry Composition of Employment, Moree

	Employment (No.)			Employment (%)		
	1996	2001	2006	1996	2001	2006
Primary industry	1,704	2,157	1,593	29	31	28
Manufacturing	324	268	294	5	4	5
Utilities & building	396	407	364	7	6	6
Trade	1,354	1,629	1,319	23	24	23
Transports & communication	410	327	418	7	5	7
Business & financial services	467	591	510	8	9	9
Public sector services	248	310	212	4	4	4
Personal services	1,003	1,209	1,046	17	18	18
Total	5,907	6,899	5,756	100	100	100

The implications from these data are the limited progress made toward a more diversified economy that is less exposed to the instability associated with agricultural production and commodity markets. The index shown in Figure 3-5 has shown only a small decline since 1981. (The index ranges from 100 for a one industry economy to 0 for the Australian economy.) This suggests that new efforts are needed to build more diversity into the economy.

Figure 3-5: Index of Specialisation, Moree

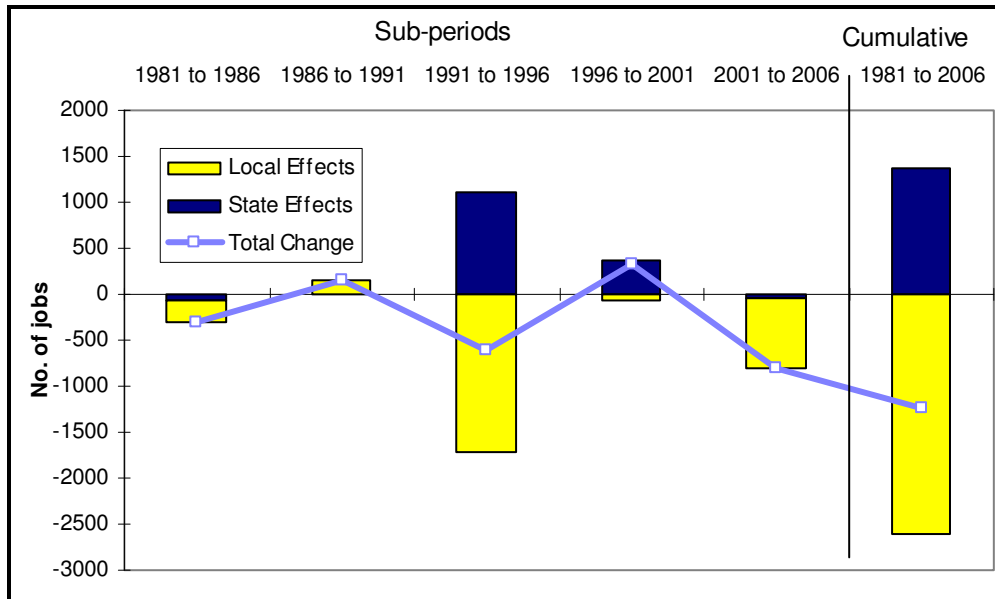


Second, with little or negative change in employment, economic growth is limited to that from rising productivity. While this has been relatively strong in agriculture, it is less so for the remaining industries. Thus, the result is that the growth in the Moree economy is lagging behind that of NSW and the nation. A summary of the shift-share analysis is shown in Figure 3-6

The shift-share analysis benchmarks Moree against the performance of the NSW economy. If Moree had kept pace with NSW, then over the 1981 to 2006 period, it would have about 1500 more employees (the dark blue segments). In reality, the change is shown as the “total change” and indicates a decline of 1243 jobs.

Thus, over the 25 years, Moree has lost its share of the NSW economy by the equivalent of almost 2750 jobs (relative to present employment of about 6000). In 2006, Moree is around one-third smaller than it would have been if it had kept pace with the NSW economy. Finding new opportunities for growth is a high priority strategic issue and will mainly lie in non-agricultural industries.

Figure 3-6: Moree Growth Relative to NSW Growth

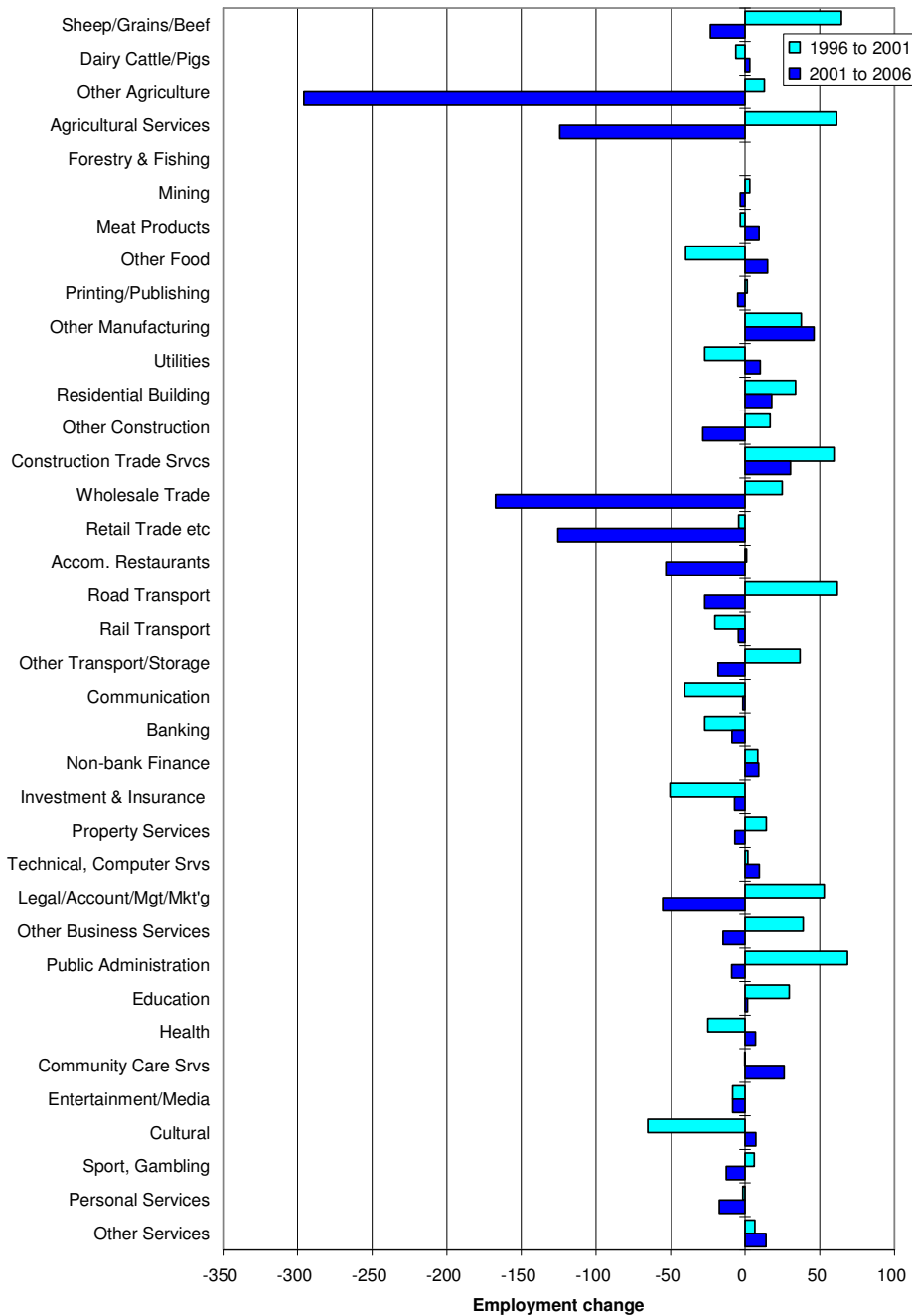


The analysis also ranks industries in terms of their growth as indicated by the employment change over five years shown in Figure 3-7. The two periods represent a considerable contrast with the period 1996 to 2001 showing strong growth in employment from a relatively low base in 1996 when the effects of drought were significant. The growth in employment was concentrated in agriculture, other manufacturing, building and construction, road transport, some business services and public administration reflecting an improving business and household income situation. Those growth areas were offset to some degree by rationalisations in public sector activity such as communications, utilities and banking.

The situation in the 2001 to 2006 period was dominated by poor seasonal conditions that reversed the gains made in the previous five years and then some. There were widespread losses in employment in agriculture and related activities such as trade and road transport with losses in construction and some business services. This highlights the need for nurturing diversity and robustness into the economy. There may be some opportunities in areas where there is evidence of industry strength including:

- Machinery and other fabricated metal products for agriculture, mining and other users;
- Transport with the possible inland rail development; and
- A resumption of growth in a range of advanced business services (research, marketing, legal, accountancy etc).

Figure 3-7: Changes in Employment 1996 to 2006



There are opportunities to build greater diversity into the Moree economy. A turnaround in agriculture may be the kick start in income growth and confidence needed for a broadly-based business development program. There are also opportunities to develop businesses in Moree that can stem some of the leakages of expenditures from Moree to other areas (see below on service delivery). That may include an improvement of the competitiveness of existing Moree businesses.

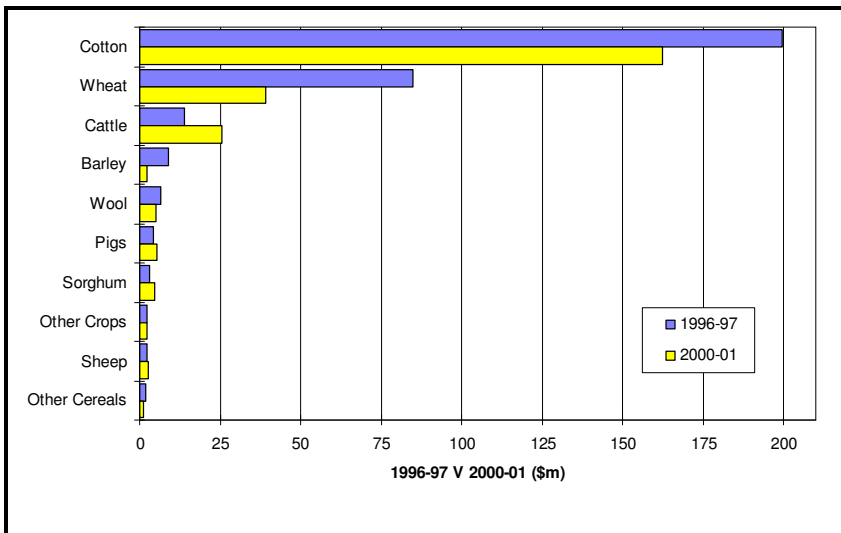
Agricultural production is a key factor in the performance of the Moree economy. The value of production is indicated in Table 3-5 including some estimates for 2005-06 that may prove to be conservative. But they will be below what would be considered to be normal and are a major factor in the slowdown in the Moree economy. The severe effects of the drought were beginning to emerge by mid 2006 and in the successive years resulted in levels of agricultural production below that of 2005-06. These events highlight not only the high dependence on agriculture, but a high level of specialisation within agriculture on cotton and wheat, although diversity is gained from the potential for both summer and winter cropping. Note that in 2000-01, there were considerable losses associated with early summer floods.

Table 3-5: Gross Value of Agricultural Production, Moree

Commodity	1996-1997 (\$m)	2000-01 (\$m)	2005-06 (\$m)
Cotton	404	321	318
Wheat	218	74	300
Barley	37	15	
Cattle	21	37	34
Sorghum	11	31	
Other crops	10	17	11
Oilseeds	5	3	
Other fruit	4	2	
Sheep	4	3	
Pigs	2	1	
Other cereals	2	2	
Wool	1	8	
Total	719	513	663

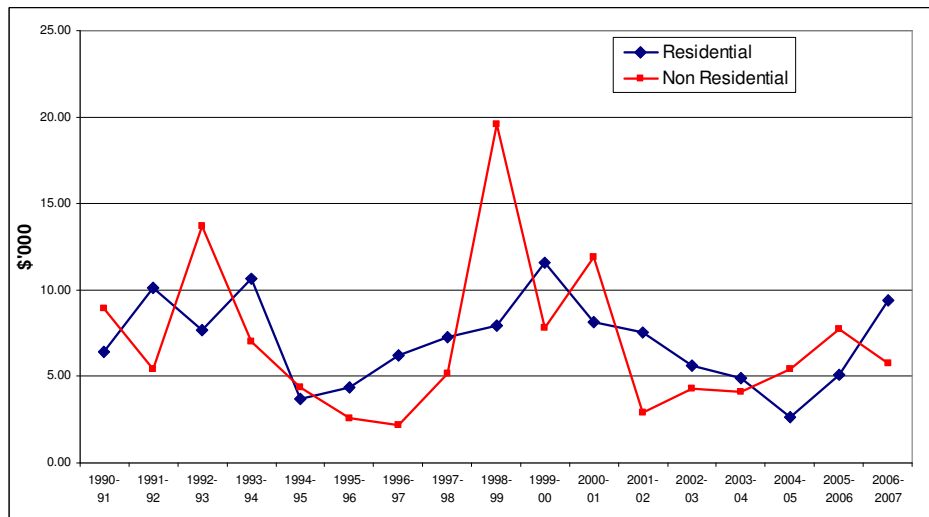
Note: 2005-06 estimates by CARE of the main categories and subject to revision

Figure 3-8: Gross Value of Agricultural Production



Building is an indicator of the strength and prospects for an economy. Residential construction is an indicator of population growth while non-residential construction is an indicator of the overall level of business investment. The annual approvals data are shown in Figure 3-9.

Figure 3-9: Building Approvals, Moree

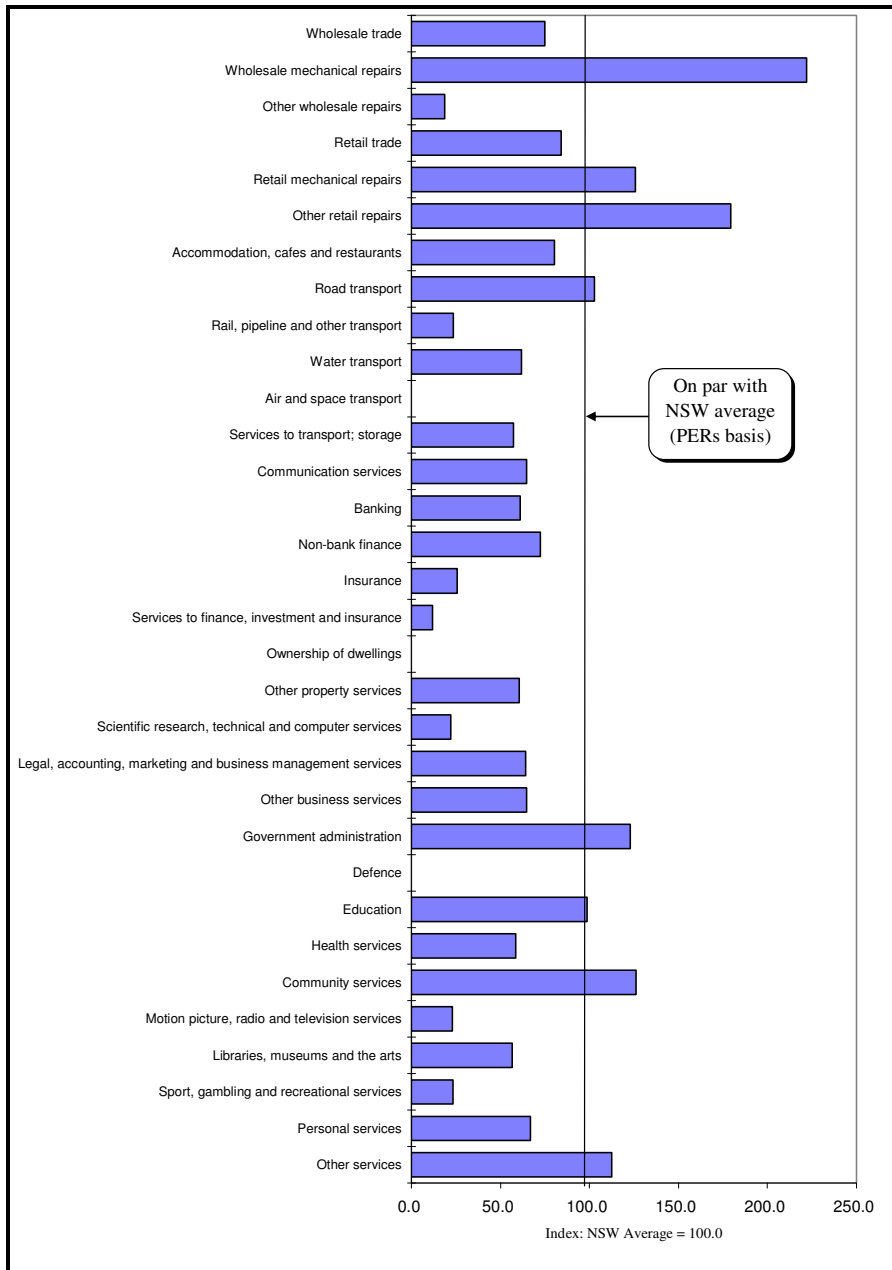


The building data show a flat trend with increases in both series up to the early 2000s but weakness since then as the drought conditions persisted.

3.3.1 Service Delivery Levels

A benchmarking process for measuring the level of services in a region is to calculate for each industry the ratio between the population and the number employed in the particular service industry (known as a Population Employment Ratio – PER). For Moree, these are shown in Figure 3-10 for each of the main service industries as a ratio of the overall level for NSW. A value of 100 indicates parity with the NSW average.

Figure 3-10: Service Delivery Index 2006 Moree



Moree has strengths in some notable areas, the most prominent being those related to various types of metal fabrication and repairs to machinery and structures. In addition, Moree is strong in road transport, community services, other services and education. Some areas of business services would also have development potential.

A notable weakness in services lies in health where the number employed represents just over 60 per cent of the NSW average. Moree has a less significant set of research and technology services than does Narrabri.

3.4 COTTON AND THE MOREE ECONOMY

The Moree economy is represented in the form of an input-output table. The table is a preliminary one given the ABS has not completed estimates of the value of agricultural production. It provides a structure that can be used to compare economies over time in a consistent way. It is also used to derive multipliers that estimate the flow-on impacts associated with the cotton industry.

There are a number of ways to present some summaries of the information derived from the input-output table. In this case, a chart showing the industry contributions to GRP is shown in 'Figure 3-11. This is an aggregated version of information that includes 109 industries.

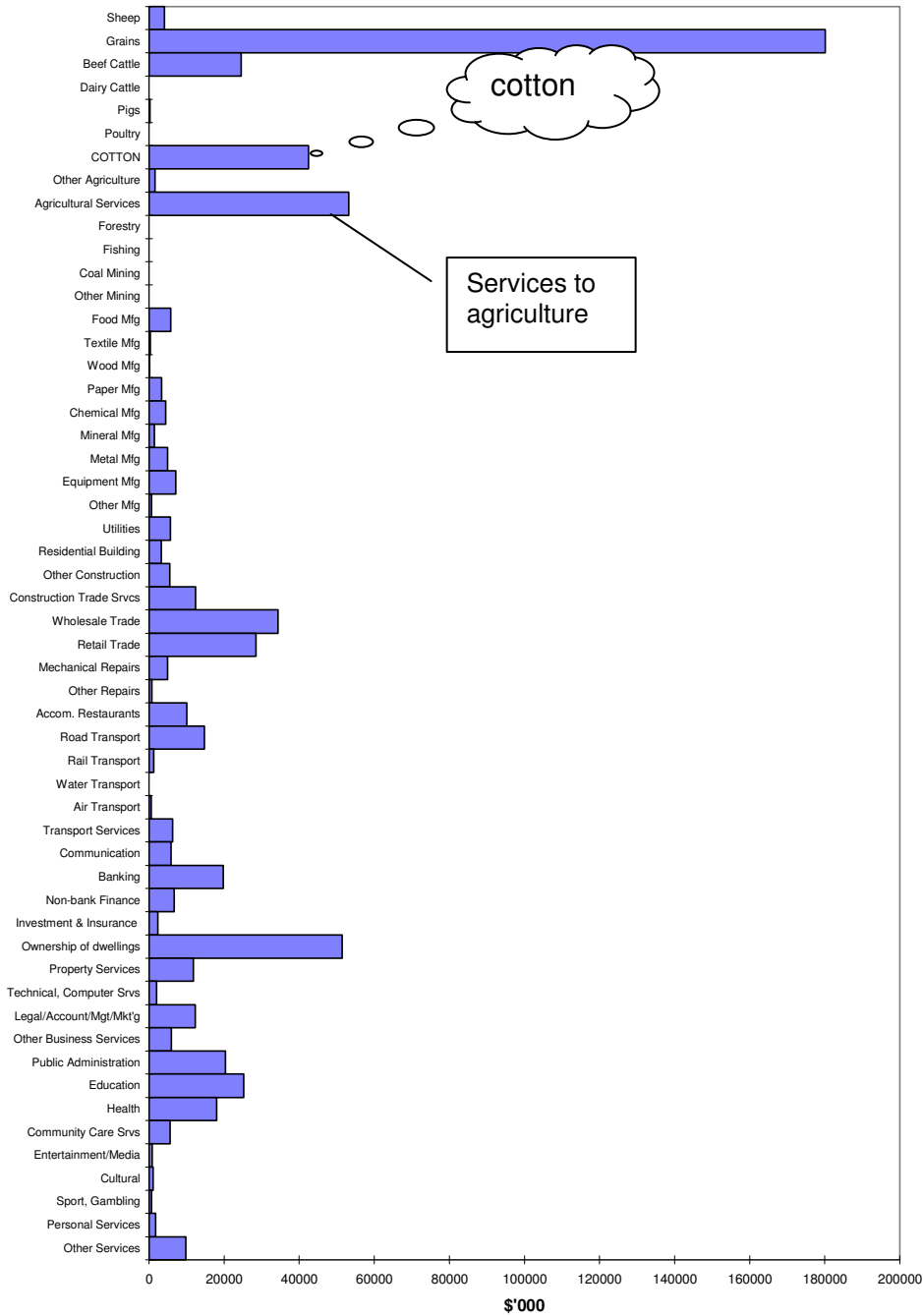
The features shown by this figure include:

- The dominance of the primary industries and grain production is apparent, even in a period when the value of agricultural production has been depressed because of drought. This table shows the cereal crops harvested in late 2005 and the cotton crop harvested in 2006. The latter was near to average, but conditions in mid 2006 were indicating poor winter crops and low water availability for the next irrigation season. As a result, the economy was already slowing rapidly by the end of the 2005-06 year (when the population census was taken).
- The cotton industry and services to agriculture are important contributors even though they are dwarfed by grain production in a regular season.
- The services to agriculture is also an important industry that is closely linked to cotton as it includes a range of crop husbandry operations, contract harvesting and cotton ginning. Many of these activities were subsequently reduced with smaller cotton crops.
- The rental value and imputed value of owner-operated housing is one of the largest contributors to GRP. Inclusion of these values is conventional and helps to show the real value of the economic activities to residents.
- The other key industries are those relating to trade. Wholesale trade is significant as it handles much of the agricultural production. The

wholesalers tend to have variable employment depending on the level of agricultural production.

- Those sectors with substantial public funding, education, health and community care are also important, although health is notably lower than it should be.

Figure 3-11: Industry Composition of the Moree Economy



3.5 THE ECONOMIC IMPACTS OF THE COTTON INDUSTRY

The analysis is shown for cotton growing and cotton research. The input-output model is used to calculate multipliers to estimate the flow-on effects. The multipliers are shown in the Attachments to this section.

3.5.1 Cotton Growing

A summary of the impacts for cotton growing is provided in Table 3-6. These show the flow-on and total impact of cotton growing that had a gross output of \$318m. Directly, cotton growing generated value added of \$51m, employment of 406 people who received income from employment of \$31m.

Table 3-6: Moree, Cotton Growing Impacts

MOREE COTTON GROWING IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	318,222	193,701	46,287	239,988	558,210
Value-Added (\$'000)	50,852	91,648	27,821	119,468	170,320
Household Income (\$'000)	31,536	34,591	10,599	45,190	76,726
Employment (no.)	406	598	257	856	1,262

The total impact resulted in estimates of value added of \$170m, 1,262 jobs earning \$77m for their households. The large flow-on effects is concentrated in the production category and is a reflection of the large amount of services that are purchased by growers from other specialists. This includes cotton ginning, consultants and contracted farm operations such as spraying. Relatively few impacts accrue from the purchase of materials as most of those are imported with local distribution margins accruing locally.

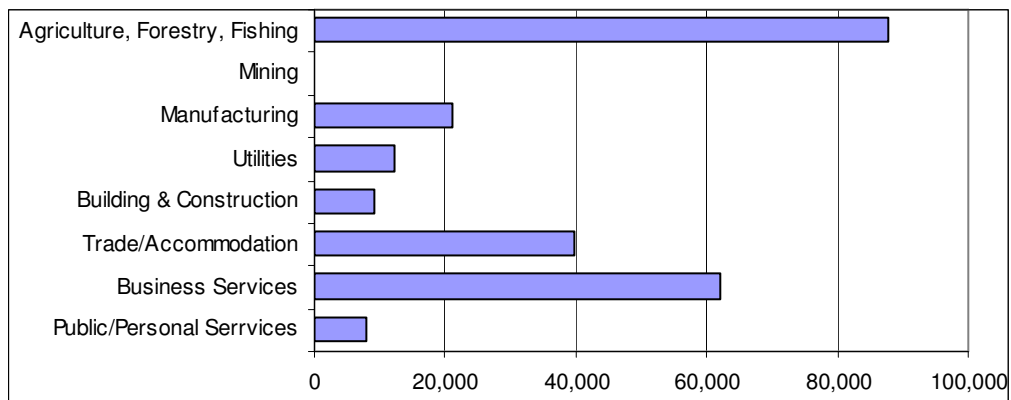
The distribution of the flow-on impacts by broad industry groups is shown in Figure 3-12 (further industry details are included in the Attachments to this section). This highlights the heavy concentration on the agriculture services activities and the use of a range of business and trade services. There are few flow-ons to manufacturing from within the cotton industry itself, or via the consumption-induced effects. The latter is a reflection of the limited local production of manufactured consumer goods.

Relative to the Moree region, the total impact of cotton growing amounts to

- 24 per cent of gross output

- 29 per cent of value added
- 21 per cent of employment and
- 21 per cent of household income from employment.

Figure 3-12: Distribution of Growing Flow-on Effects by Broad Sector (\$'000)



3.5.2 Cotton Research

Cotton research nominated for Moree by the Cotton CRC in 2006-07 included expenditures and in-kind contributions valued at \$1.808m. There were no other research contributions to the Moree region by the Cotton Research and Development Corporation.

The cotton research impacts are shown in Table 3-7. The multipliers and the detailed distribution of flow-on impacts are shown in the Attachments.

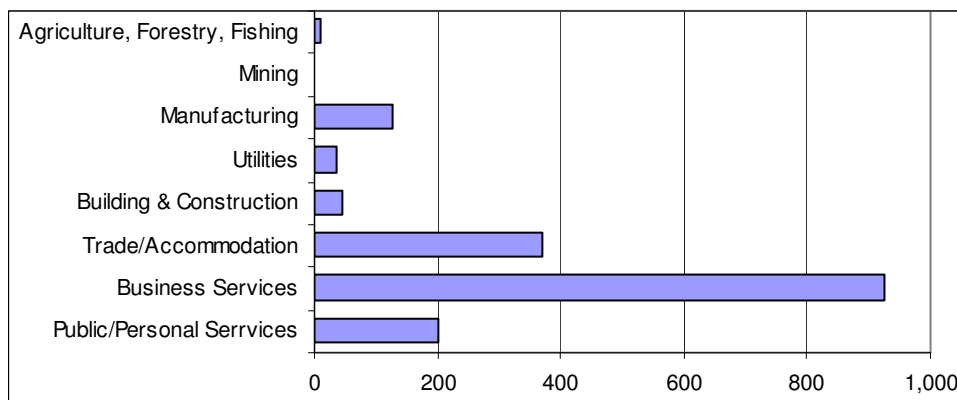
Table 3-7: Moree, Cotton Research Impacts

MOREE COTTON RESEARCH IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	1,808	914	797	1,712	3,520
Value-Added (\$'000)	882	434	479	913	1,795
Household Income (\$'000)	855	284	183	466	1321
Employment (no.)	14	5	4	10	24

Cotton research in Moree directly amounted to \$0.9m of value added, employed 14 people who earned \$0.85m from that employment. With flow-on effects, the impact amounted to \$1.8m of value added and 24 people employed earning \$1.3m. These levels are around one per cent of the impact of cotton growing in

terms of value added and two per cent of employment (or about one-third of one per cent of the economy). Research activities have a high labour intensity and generate high consumption-induced flow-on impacts. As a result, they are more important in employment terms than they are as measured by value added. Most of the flow-on impacts accrue to the service industries as indicated in Figure 2-13. Relative to the total Moree economy, the research activities amount to less than one per cent.

Figure 3-13: Distribution of Research Flow-on Effects by Broad Sector (\$'000)



3.6 SUMMARY

The Moree economy is relatively large but highly specialised. In a sense, its strategy has a strong focus on identifying what they are best at and being among the world's best. Agriculture, especially cotton and grains is at the forefront. Much of the balance of the economy is linked in some way to those key agricultural activities. In 2005-06, cotton contributed almost 30 per cent to the Moree economy. That model does imply inherent volatility in production, employment and income with most agriculture-related businesses able to operate successfully through that volatility. Other businesses may find it more difficult which may be a factor in the limited diversity in the economy.

Unlike some other regions involved in these case studies, significant new energy-based developments are not prominent in Moree. That is not to rule out such developments but at this time there are none at the implementation stage. However, there are proposals for a gas pipeline that will pass nearby Moree and thereby provide a competitive energy resource to the local economy.

There are signs in the data that point to some of the weaknesses of this approach. First, there is a dominance of males in the population reflecting the dominance of industries that tend to employ males rather than females. Second,

there is a relatively low level of services relative to NSW and other regions. This complements the limited employment opportunities for females. Third, the volatility in the regional economy is likely to have implications for the provision of services and the capacity to attract and retain suitable employees, especially in a tight labour market. Four, it seems that there is a high level of leakages of expenditure from the region representing lost local business opportunities.

The above suggests that a diversification of the economy would provide substantial benefits for Moree. The focus would need to be on industries that are not necessarily linked to agriculture, but would use other resources, especially knowledge, and supply to both local and distant markets. If that is not possible, then there exists a significant irony for Moree in terms of being excellent in matters rural, but not in many other industry categories.

The benefits of building diversity will have the objectives of reducing volatility, but also provide a wider array of job opportunities, especially for women and indigenous people. This should also add some depth and breadth to the labour market making Moree more competitive in the national workplace. There would be an added bonus from being more competitive in attracting higher levels of various services in Moree, especially in relation to health that is notably poorly serviced according to the measures used in this analysis.

ATTACHMENTS

MOREE COTTON GROWING MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.609	0.145	0.754	1.754	1.754
Value-Added (\$)	0.160	0.288	0.087	0.375	0.535	3.349
Household Income (\$)	0.099	0.109	0.033	0.142	0.241	2.433
Employment (no./\$m)	1.3	1.9	0.8	2.7	4.0	3.107

MOREE COTTON RESEARCH MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.506	0.441	0.947	1.947	1.947
Value-Added (\$)	0.488	0.240	0.265	0.505	0.993	2.036
Household Income (\$)	0.473	0.157	0.101	0.258	0.731	1.545
Employment (no./\$m)	7.9	2.9	2.5	5.4	13.3	1.680

Impact Distribution Ranked by Industry: Moree Cotton Growing

Moree Cotton Growing Industry: Output Flow-on Impacts	Ranked Flow-on	
	\$'000	%
Services to agriculture; hunting and trapping	86,338	36.0
Wholesale trade	20,463	8.5
Road transport	15,670	6.5
Water supply; sewerage and drainage services	11,415	4.8
Ownership of dwellings	11,034	4.6
Retail trade	10,898	4.5
Banking	8,326	3.5
Legal, accounting, marketing and business management services	6,920	2.9
Other property services	6,681	2.8
Basic chemicals	6,548	2.7
Agricultural, mining, lifting and construction machinery	5,711	2.4
Other construction	4,465	1.9
Accommodation, cafes and restaurants	4,460	1.9
Construction trade services	3,934	1.6
Services to transport; storage	2,910	1.2
Non-bank finance	2,816	1.2
Retail mechanical repairs	2,792	1.2
Education	2,338	1.0
Other business services	2,259	0.9
Communication services	2,208	0.9

Impact Distribution Ranked by Industry: Moree Cotton Research

Moree Cotton Research: Output Flow-on Impacts	Ranked Flow-on	
	\$'000	%
Ownership of dwellings	190	11.1
Legal, accounting, marketing and business management services	157	9.2
Scientific research, technical and computer services	150	8.7
Retail trade	133	7.8
Other business services	111	6.5
Wholesale trade	103	6.0
Accommodation, cafes and restaurants	81	4.7
Other property services	69	4.1
Banking	68	4.0
Education	54	3.2
Communication services	52	3.1
Motion picture, radio and television services	42	2.4
Services to transport; storage	38	2.2
Road transport	30	1.7
Construction trade services	30	1.7
Publishing; recorded media and publishing	28	1.7
Retail mechanical repairs	28	1.7
Non-bank finance	26	1.5
Government administration	26	1.5
Water supply; sewerage and drainage services	26	1.5

4. NARROMINE

Narromine is a small community in Central NSW with Dubbo not far away. Trangie is a smaller town to the west. This has been a broadacre cropping and grazing region. Access to irrigation water from the Macquarie River has provided an opportunity for diversification. That has included the growing of cotton and some specialised intensive production (eg., a rose propagation nursery). In the past it has also been producing vegetables for processing. The access to irrigation water has been related to the amount of water allocated to the notable Macquarie Marshes area.

4.1 DEMOGRAPHIC CHARACTERISTICS

The Narromine population has been relatively steady over the last two decades which is unusual in most areas of inland Australia (Table 4-1). Employment recorded as either where they live (residence) has been relatively stable while where they work (workplace) has declined. It would seem that Narromine has been able to maintain its population mainly by becoming more integrated with the regional centre of Dubbo where an increasing number are employed.

There has been a high level of commuting from Narromine to work, mostly to Dubbo. Those workers are travelling to jobs in many industries: grains, residential building, construction trades, wholesale trade, retail trade, road transport, communications, legal and accounting, government administration, health and community care. There were no Narromine industries with significant net commuting in. It is possible that most of this is normal given the proximity of Narromine to Dubbo, and it is likely to be a high proportion of women among the commuters. Some of the growth between 2001 and 2006 may be temporary and related to the drought effects that were significant in 2006 and subsequently became worse.

Table 4-1: Population and Employment Summary, Narromine

Census Year	Resident Population	Employment by Residence	Employment by Workplace	Net Commuting to Work
1981	6,650	2,803	na	na
1991	6,950	2,698	na	na
2001	6,781	2,816	2,334	482
2006	6,507	2,813	2,159	654

The age profile of Narromine is shown in Figure 4-1 and indicates the following characteristics:

Figure 4-1: Age Profile, Narromine 2006

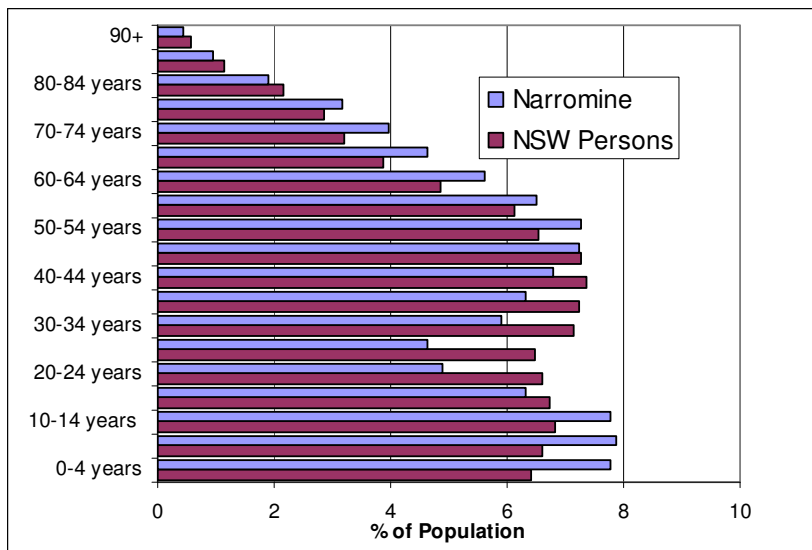
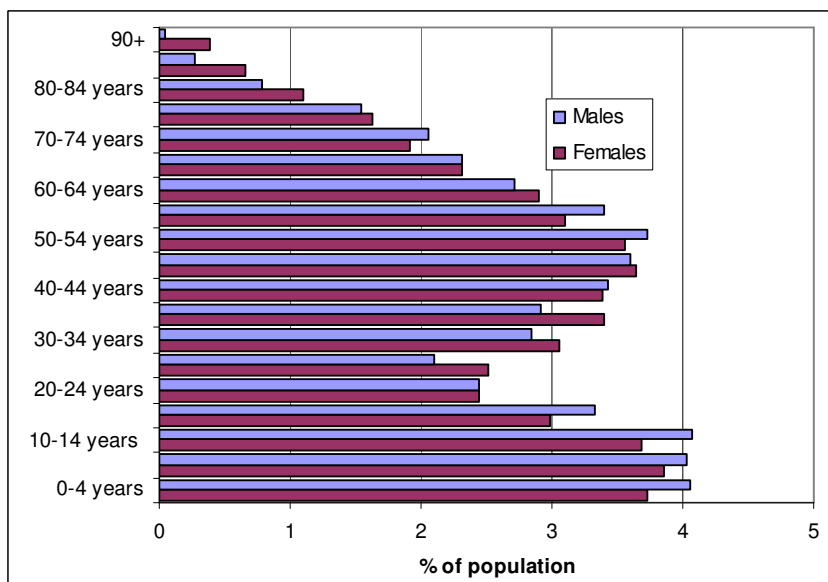


Figure 4-2: Age Profile by Sex, Narromine 2006



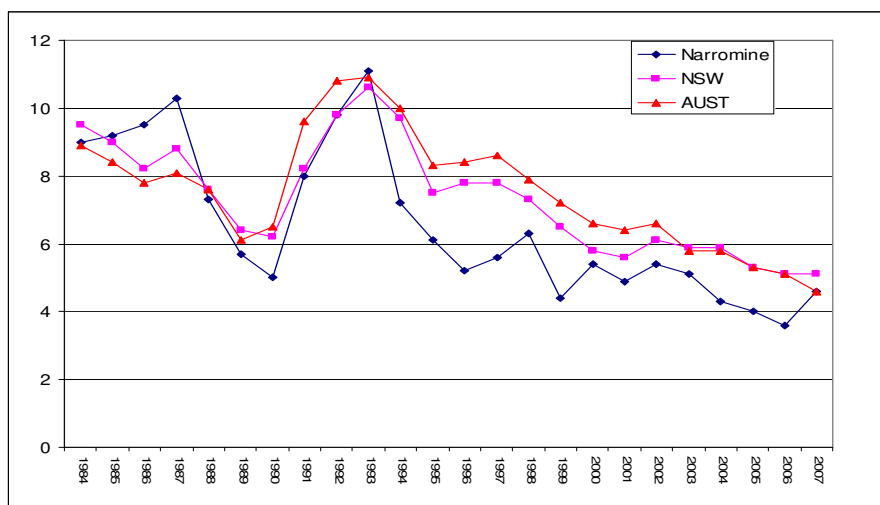
- The age profile of the Narromine population is generally older than that for NSW. Through the working age groups 15 to 49, Narromine has a smaller share than in NSW and especially in the 20 to 29 groups. Beyond age 55, the share exceeds that of NSW.
- The birth rate in Narromine is greater than the NSW average with a higher proportion of the population within the 0-14 year age group.
- The share of males and females in the working ages is about the same although in the 25 to 39 age groups there is a higher share for females. That suggests there might be a tendency for more young males than

females to leave Narromine while females have employment opportunities in Dubbo.

4.2 UNEMPLOYMENT AND INCOME

Unemployment in Narromine has mostly been lower than the NSW and Australian level for the past decades (Figure 4-3). There has also been a strong decline from a peak in the early 1990s.

Figure 4-3: Unemployment, Narromine



Narromine households in 2001 had a disposable income 20 per cent below the NSW average (Table 4-2). Relative to the NSW average, earnings from own unincorporated businesses and government benefits have higher shares and wages and salaries a lower share. More recent comparable household income data are not available. It is likely that the level of income is lower in 2005-06 because of drought, but the composition would be similar to that of 2001.

Table 4-2: Composition of Household Income, Narromine

Income Source	Narromine	Percentage	NSW	Percentage
Wages and Salary (\$m)	67.00	60	99,869	72
Own Unincorporated Business (\$m)	17.70	16	8,733	6
Investment (\$m)	8.60	8	12,121	9
Superannuation and Annuity (\$m)	1.30	1	2,962	2
Government cash benefits (\$m)	16.60	15	13,919	10
Other income (\$m)	0.20	0	1,203	1
Total income from all sources (\$m)	111.50	100	138,808	100
Net Tax (\$m)	18.60	17	31,389	23
Average weekly household Disposable Income (\$)	720.00		895.00	

4.3 ECONOMIC STRUCTURE AND TRENDS

The information in this section is built mainly on analysis of the detailed employment data collected every five years as part of the population census. Other data are taken from the input-output table for the region compiled for this project.

A summary of the key statistics for Narromine in 2005-06 is shown in Table 4-3. These are measures used in the national accounts applied at the regional level.

Table 4-3: Summary Measures of the Narromine Economy

Regional Economy Measures: Narromine	Value 2005-06
Gross Regional Product \$m	205
Population 2006	6,507
GRP/capita \$	31,505
Exports \$m	124
Exports share of GRP %	60
Imports \$m	181
Imports share of GRP %	88
Trade Balance \$m	-57
Household Employment Earnings \$m	77
Household Expenditure \$m	198
Household Balance \$m	-121

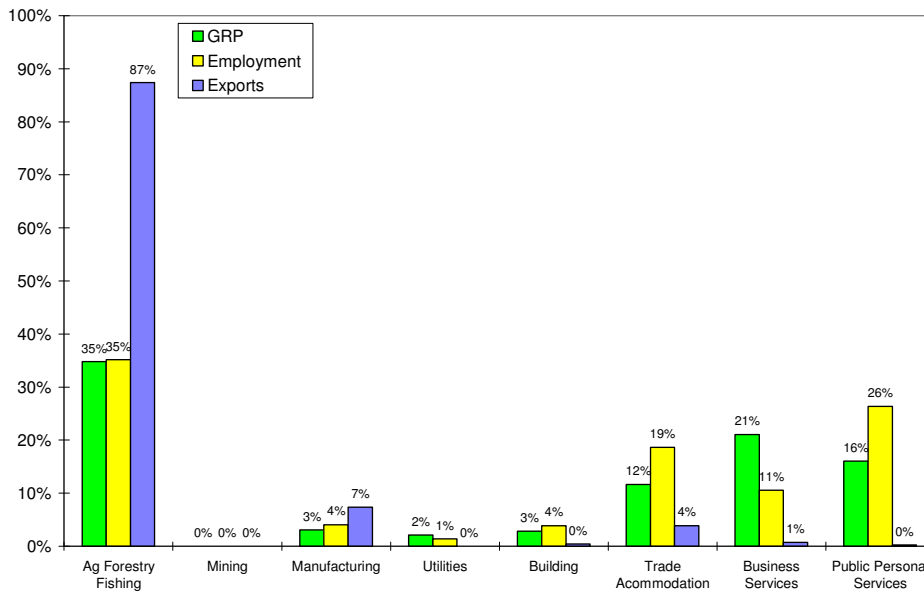
The key features of these estimates are;

- The GRP at \$205m and the GRP/capita are relatively low because of the effects of drought. While a precise estimate is difficult, it could be around 20 per cent below a normal level. However, worse conditions were to come in the next two years when agricultural production was reduced substantially.
- Narromine is an 'open' economy with the level of exports representing a high share of GRP. The level of imports is also very high level relative to GRP. Most consumer goods and the materials used in key industries such as agriculture are mainly imported. These measures reflect the limited diversity of the Narromine economy. Overall imports exceed exports, especially in periods when agricultural production is low because of seasonal conditions.
- The earnings from employment are estimated to be \$77m, well below the level of household expenditure (by \$121m). The difference will be made up from other sources of income including welfare payments, withdrawals from savings and superannuation, earnings from investments, the

operating surpluses from owner-operated businesses and borrowings. The expenditure level is boosted by the inclusion of an imputed value of owner-occupied dwellings. The poor seasonal conditions would be exacerbating this deficiency.

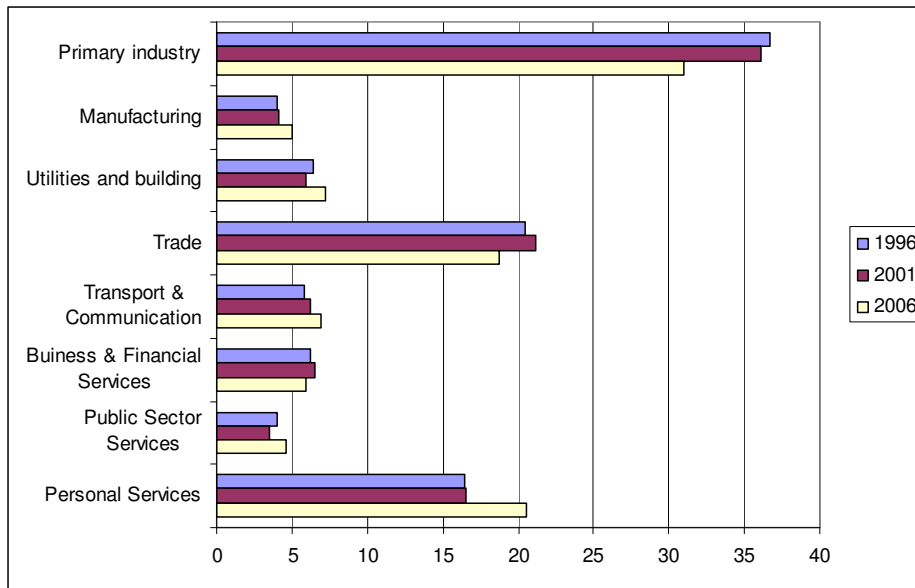
A perspective of the structure of the economy is shown in Figure 4-4. This highlights the dominance of primary industries especially in exports. There are limited shares attributed to mining, manufacturing, other than those associated with agriculture, utilities and building. Most of the other economic activity is associated with a range of services.

Figure 4-4: Industry Structure of the Narromine Economy, 2006



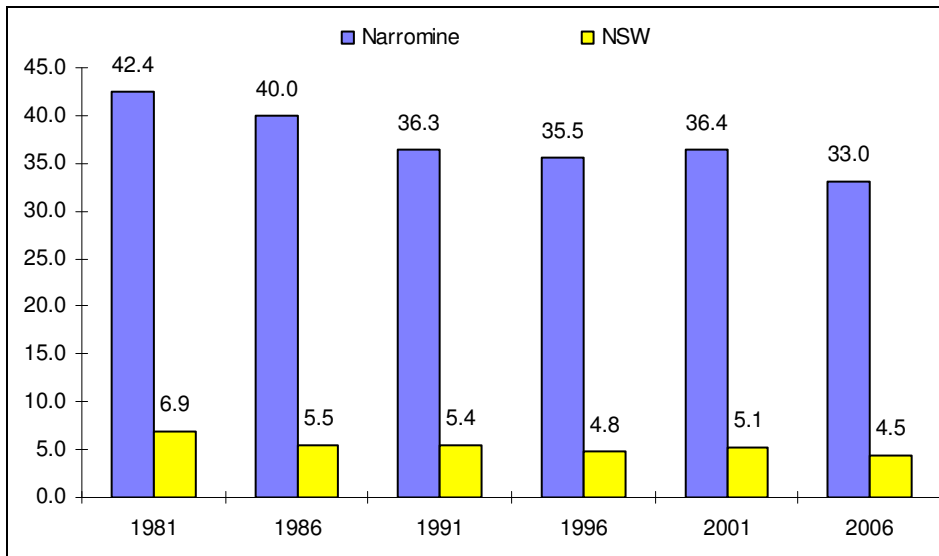
A time perspective is provided by the data in Figure 4-5 (these data are employment by residence). These summary data show a tendency for primary industries and trade to lose some share while personal services are increasing. Because these data are residence based, they also reflect the employment opportunities in Dubbo. The overall structure of the Narromine economy over the last decade is relatively stable.

Figure 4-5: Industry Composition of Employment, Narromine (%)



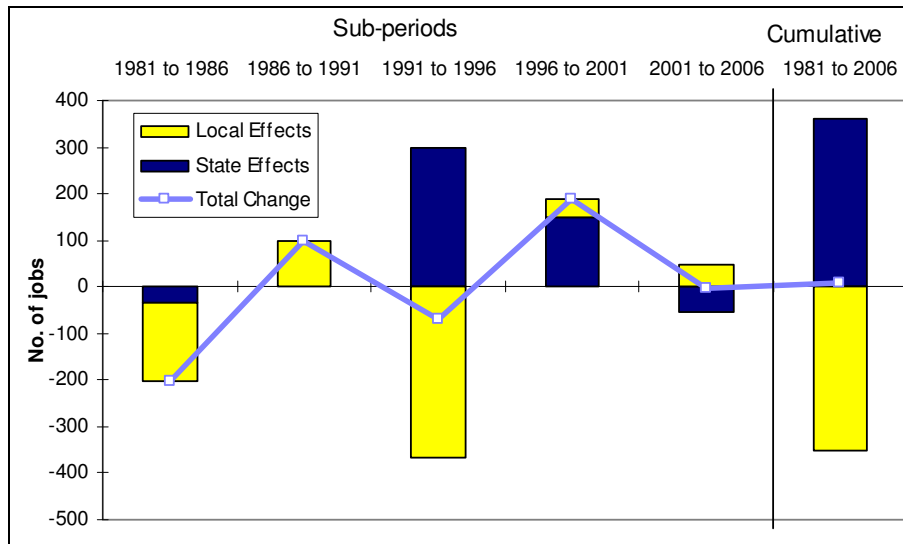
The implications from these data are the limited progress made toward a more diversified economy since 1990 that is less exposed to the instability associated with primary production and commodity markets. The index shown in Figure 4-6 has shown only a small decline since 1981. The data are residence based and will include employment of residents in Dubbo that would help build increased diversity. (The index ranges from 100 for a one industry economy to 0 for the Australian economy.) This suggests that new efforts are needed to build more diversity into the economy.

Figure 4-6: Index of Specialisation, Narromine



Second, with little or negative change in employment, economic growth is limited to that from rising productivity. While this has been relatively strong in agriculture, it is less so for the remaining industries on a national level. Thus, the result is that the growth in the Narromine economy is lagging behind that of NSW and the nation. A summary of the shift-share analysis is shown in Figure 4-7.

Figure 4-7: Narromine Growth Relative to NSW Growth



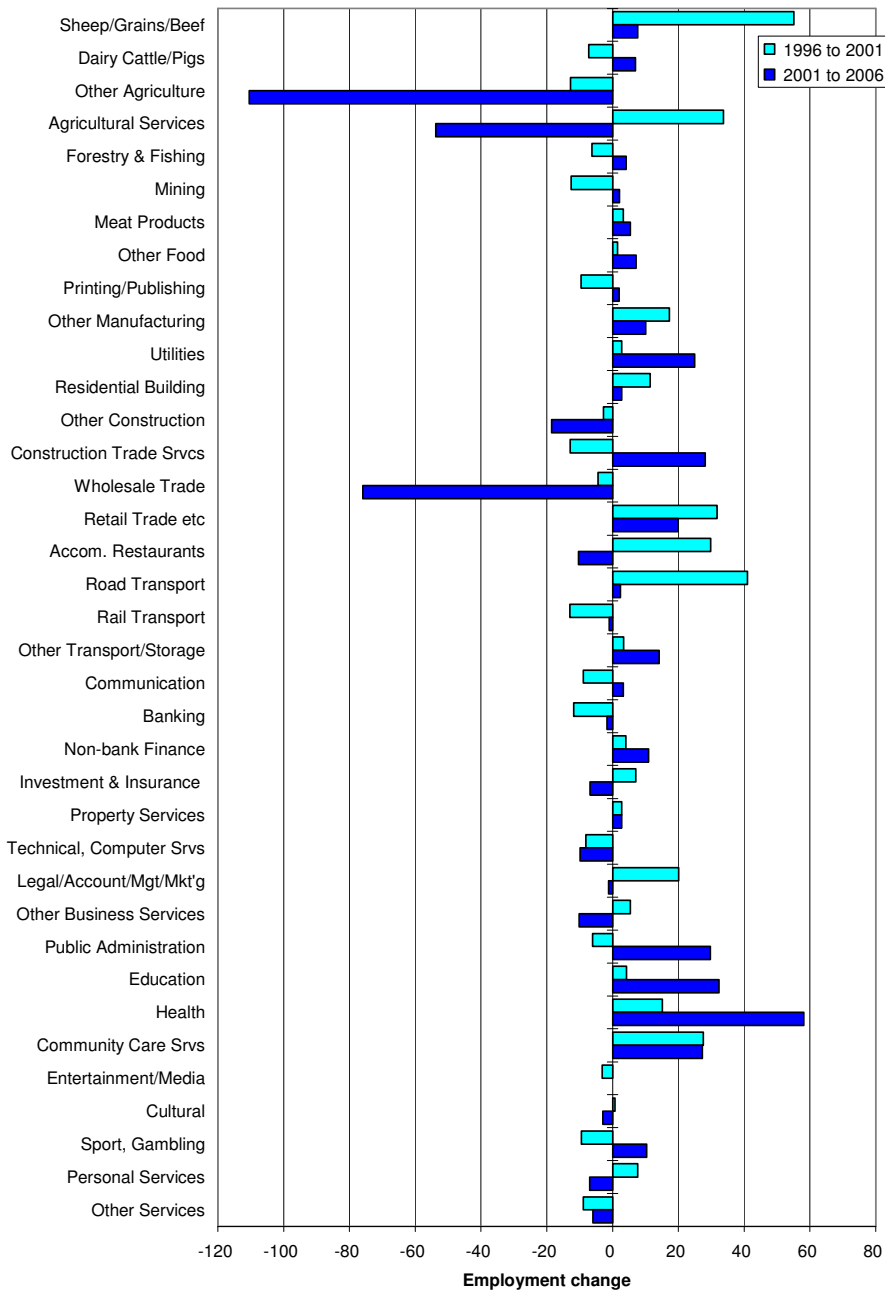
The shift-share analysis (also in terms of residence) benchmarks Narromine against the performance of the NSW economy. If Narromine had kept pace with NSW, then over the 1981 to 2006 period, it would have about 350 more employees (the dark blue segments). In reality, the change is shown as the “total change” and indicates a small increase of 10 jobs. Thus, over the 25 years, Narromine has lost its share of the NSW economy by the equivalent of almost 340 jobs (relative to present employment of about 2000). In 2006, Narromine is around one-sixth smaller than it would have been if it had kept pace with the NSW economy. Finding new growth opportunities for growth in the Narromine is a high priority strategic issue and will mainly lie in non-agricultural industries.

Given the nature of the region, this is a relatively good result but influenced by the jobs available to residents in Dubbo that has been growing rapidly. The analysis of workplace data (only available for 2001 to 2006) indicates that there was an overall decline in employment of 175, and relative to NSW a loss of 201 jobs. This is equivalent to a loss equivalent to the NSW average of around 10 per cent of the workforce.

The analysis also ranks industries in terms of their growth as indicated by the employment change over five years shown in Figure 4-8 (also in residence terms). The two periods are very different with the period 1996 to 2001 showing strong growth in employment from a relatively low base in 1996 when the after-

effects of drought and recession were significant. The growth in employment was concentrated in agriculture and related sectors, plus a range of services. Some of these changes will reflect developments in Dubbo. There were only small losses in employment in several sectors but overall it was strongly positive.

Figure 4-8: Changes in Employment 1996 to 2006



The situation in the 2001 to 2006 period was surprisingly good with stability overall. That stability covered up some large changes in particular industries.

There were widespread losses in employment in agriculture and related activities such as wholesale trade – industries that are predominately located in Narromine Shire. On the other hand, there were gains in utilities, construction trades, public administration, education health and community care that balanced out the losses. Many of these gains will likely be jobs in Dubbo. In a way, Narromine is able to use the diversity of industry in Dubbo as insulation against the instability that arises from a high dependence on agriculture.

A higher level of employment by commuters to Dubbo may be an appropriate strategy for Narromine. However, there will be opportunities for new business developments focused on serving the needs of the residents of Narromine. A turnaround in agriculture may be the kick start in income growth and confidence needed for a business development program along those lines. That would result in a reduction in the leakage of household expenditures from Narromine.

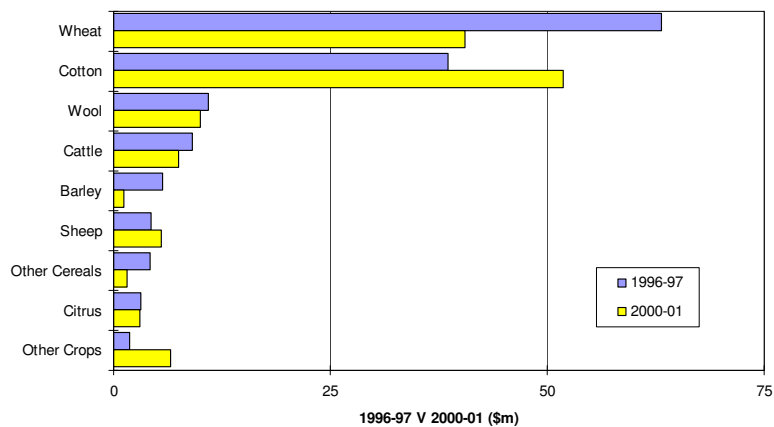
Agricultural production is a key factor in the performance of the Narromine economy. The value of production is indicated in Table 4-4 including some estimates for 2005-06 that may prove to be conservative. There is a high dependence on wheat and cotton with the latter being related to access to irrigation water. They do suggest a reduction in output that declined further in subsequent years. The severe effects of the drought were beginning to emerge by mid 2006 and were impacting the economy. These events highlight the high dependence on agriculture and a high level of specialisation within agriculture on cotton and wheat.

Table 4-4: Gross Value of Agricultural Production, Narromine

Narromine	1996-97	2000-01	2005-06
Commodity	\$m	\$m	\$m
Wheat	63	40	60
Cotton	39	52	32
Wool	11	10	11
Cattle	9	8	8
Barley	6	1	
Sheep	4	6	
Other Cereals	4	2	
Citrus	3	3	
Other Crops	2	7	11
Total	141	128	122

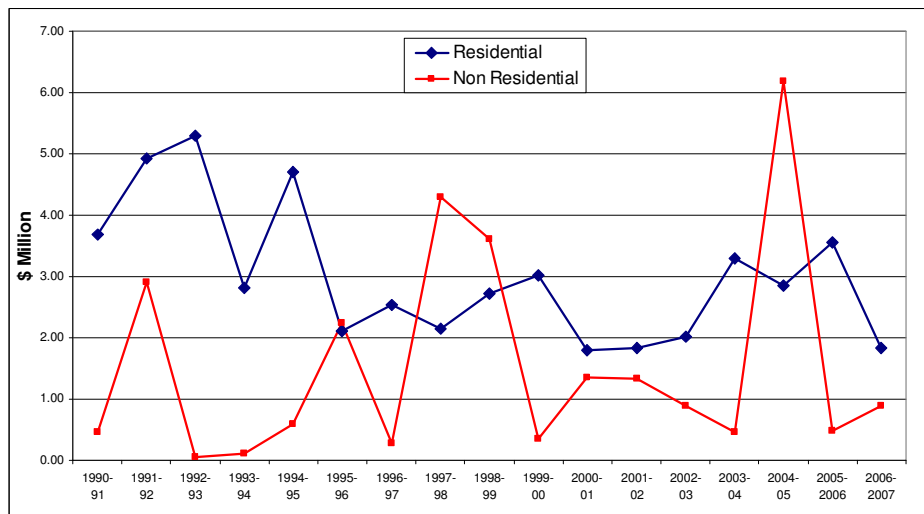
Note: 2005-06 estimates by CARE and subject to revision.

Figure 4-9: Gross Value of Agricultural Production



Building is an indicator of the strength and prospects for an economy. Residential construction is an indicator of population growth while non-residential construction is an indicator of the overall level of business investment. The annual approvals data are shown in Figure 4-10.

Figure 4-10: Building Approvals, Narromine

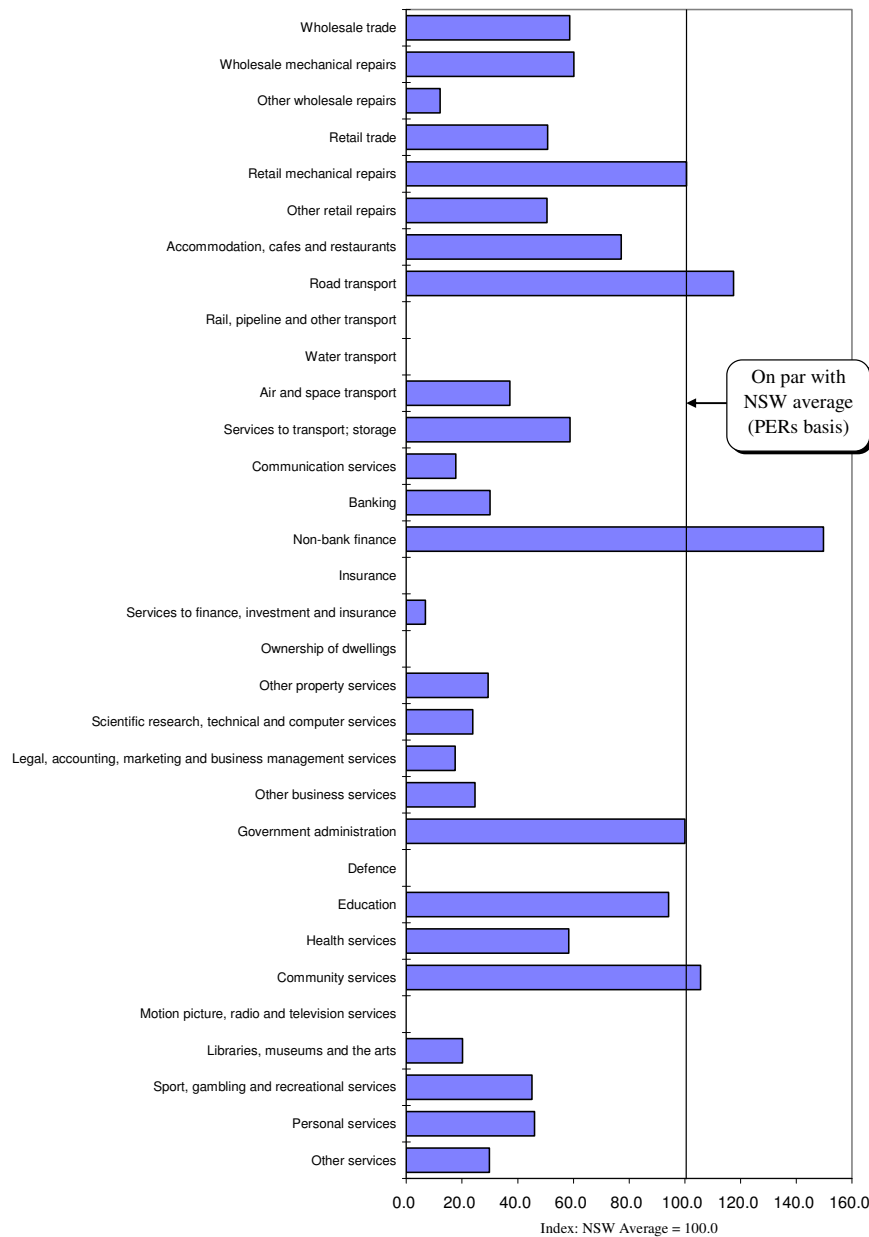


The building data show a flat trend for residential building since the early 1990s. Non-residential building is unstable as small communities have relatively infrequent commercial development. There have been notable spikes in 2004-05 and in the late 1990s, but generally the non-residential component is low reflecting low business growth.

4.3.1 Service Delivery Levels

A benchmarking process for measuring the level of services in a region is to calculate for each industry the ratio between the population and the number employed in the particular service industry (known as a Population Employment Ratio – PER). For Narromine, these are shown in Figure 4-11 for each of the main service industries as a ratio of the average level for NSW. A value of 100 indicated parity with the NSW average. The values shown are workplace-based data.

Figure 4-11: Service Delivery Index 2006 Narromine



Narromine has strengths in some notable areas, the most prominent being those related to non-bank finance, some areas of repairs and road transport. Other areas that are well serviced are government administration, education and community services. Health is below the NSW level, but that is likely given the proximity of a large array of health services in Dubbo. It is likely that Dubbo is a primary source for many services that are provided at a low level.

There is a notable low level of service in retail trade. That suggests a high leakage to other places that could be filled if appropriate and competitive retail operations can be established in Narromine. There is a need for careful analysis of the types of retail and other consumer services that are appropriate for a small centre adjacent to a regional centre and a need for it to establish an identity that is separate but complimentary to that of Dubbo. That could build diversity and slow the leakages of household expenditure.

4.4 COTTON AND THE NARROMINE ECONOMY

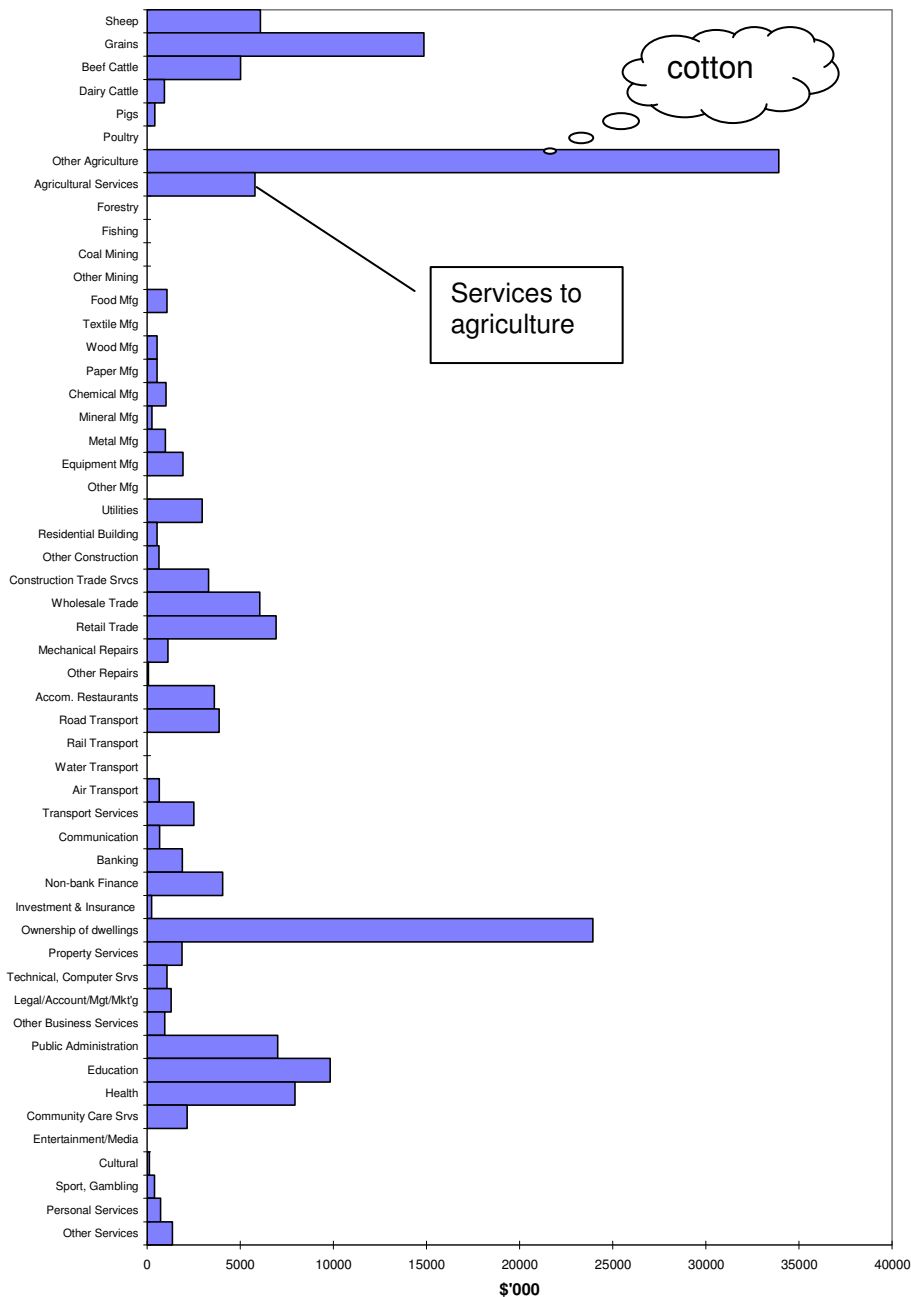
The Narromine economy is represented in the form of an input-output table. The table is a preliminary one given that the ABS are yet to publish data on the gross value of agricultural production. It provides a structure that can be used to compare economies over time in a consistent way. It is also used to derive multipliers that estimate the flow-on impacts associated with the cotton industry.

There are a number of ways to present some summaries of the information derived from the input-output table. In this case, a chart showing the industry contributions to GRP is shown in Figure 4-12. This is an aggregated version of information that includes 109 industries. The features shown by this figure include:

- The dominance of the primary industries and grain production is apparent, even in a period when the value of agricultural production has been depressed because of drought. This table shows the cereal crops harvested in late 2005 and the cotton crop harvested in 2006. Cotton was below average for recent years, but well below the level prior to 2002. In mid 2006 it was apparent that winter crops would be poor and that there would be low water availability for the next irrigation season. As a result, the economy was already slowing rapidly by the end of the 2005-06 year (when the population census was taken).
- The cotton industry and services to agriculture are important contributors even though they are dwarfed by grain production in a regular season.
- Services to agriculture is an important industry that is closely linked to cotton as it includes a range of crop husbandry operations, contract harvesting and cotton ginning. Many of these activities are reduced with smaller cotton crops.

- The rental value and imputed value of owner-operated housing is one of the largest contributors to GRP. Inclusion of these values is conventional and helps to show the real value of the economic activities to residents.

Figure 4-12: Industry Contributions to the Narromine Economy



- The other key industries are those relating to trade. Wholesale trade is significant as it handles much of the agricultural production. The

wholesalers tend to have variable employment depending on the level of agricultural production.

- Those sectors with substantial public funding, government administration education and health are also important. Community care appears lower than expected.

4.4.1 The Economic Impacts of the Cotton Industry

The analysis is shown for cotton growing. There were no cotton research activities that were identified as being based in Narromine. The input-output model is used to calculate multipliers to estimate the flow-on effects. The multipliers are shown in the Attachments to this section.

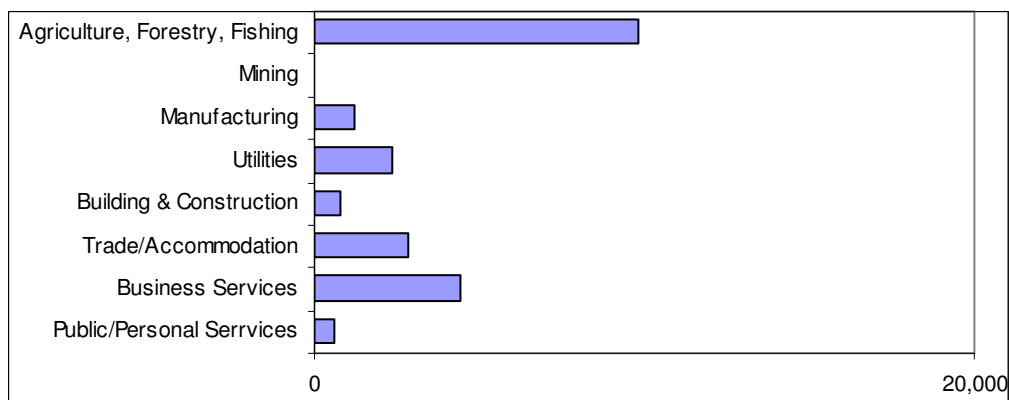
A summary of the impacts for cotton growing is provided in Table 4-5. These show the flow-on and total impact of cotton growing that had a gross output of \$32m. Directly, cotton growing generated value added of \$10.7m and employment of 69 people who received income of \$1.9m.

Table 4-5: Narromine, Cotton Growing Impacts

NARROMINE COTTON IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	32,337	18,614	3,541	22,154	54,491
Value-Added (\$'000)	10,709	9,202	2,164	11,366	22,075
Household Income (\$'000)	1,909	4,063	764	4,828	6,737
Employment (no.)	69	80	21	101	170

The total impact resulted in estimates of value added of \$22m and 170 jobs earning \$7m for their households. The large flow-on effects is concentrated in the production category and is a reflection of the large amount of services that are purchased by growers from other specialists. This includes cotton ginning, consultants and contracted farm operations such as spraying. Relatively few impacts accrue from the purchase of materials as most of those are imported with local distribution margins accruing locally. The consumption-induced impacts are small because of the limited manufacturing of consumer goods in the region and the large leakages of household spending on goods into Dubbo.

The distribution of the flow-on impacts by broad industry groups is shown in Figure 4-13 (further industry details are included in the Attachments to this section). This highlights the heavy concentration on the agriculture services activities and the use of a range of business and trade services. There are few flow-ons to manufacturing from within the cotton industry itself, or via the consumption-induced effects.

Figure 4-13: Gross Output Flow ons by Broad Industry Groups

Relative to the Narromine region, the total impact of cotton growing amounts to

- 16 per cent of gross output
- 11 per cent of value added
- 9 per cent of employment and
- 9 per cent of household income from employment.

4.5 SUMMARY

Narromine is part of the Macquarie Valley irrigation area with cotton growing and related activities. While Narromine is a relatively small cotton production region, cotton represents a significant agricultural activity for the region. The irrigation activities provide diversification for an agricultural industry based on cereal and livestock grazing activities. In total, the cotton industry total impact in 2005-06 accounted for around 10 per cent of the Narromine economy.

The Narromine Shire is a significant land area, but supports a relatively small population and workforce. Narromine itself is within commuting distance of Dubbo which is a rapidly growing regional centre. Over 20 per cent of the resident workforce had employment outside the Shire in 2006, mostly in Dubbo. In effect, the growth and economic structure of Dubbo provides an opportunity for the residents of Narromine to share those features and so reduce the high dependence on agriculture.

There is still work to be done in identifying the particular type of non-agricultural economy that is Narromine. It is likely that it will continue to be an extension of Dubbo in terms of residence but needs to define its own identity that is separate from Dubbo yet complimentary to it. This will enable the operation of Narromine as a viable business centre in its own right, lead to a reduction in the leakages to Dubbo and maintain a larger portion of residents in local employment.

ATTACHMENTS

Cotton Growing Multipliers

NARROMINE COTTON MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.576	0.109	0.685	1.685	1.685
Value-Added (\$)	0.331	0.285	0.067	0.351	0.683	2.061
Household Income (\$)	0.059	0.126	0.024	0.149	0.208	3.529
Employment (no./\$m)	2.1	2.5	0.7	3.1	5.3	2.463

Impact Distribution Ranked by Industry: Narromine Cotton Growing

Narromine: Cotton Output Industry Impacts	Ranked Flow-on	
	\$'000	%
Services to agriculture; hunting and trapping	7,765	35.1
Water supply; sewerage and drainage services	2,213	10.0
Other agriculture	2,032	9.2
Road transport	1,579	7.1
Wholesale trade	1,448	6.5
Ownership of dwellings	969	4.4
Retail trade	654	3.0
Basic chemicals	533	2.4
Other construction	508	2.3
Accommodation, cafes and restaurants	448	2.0
Banking	357	1.6
Other property services	337	1.5
Agricultural, mining, lifting and construction machinery	294	1.3
Construction trade services	267	1.2
Non-bank finance	257	1.2
Retail mechanical repairs	252	1.1
Services to transport; storage	213	1.0
Education	200	0.9
Scientific research, technical and computer services	180	0.8
Health services	160	0.7

5. WARREN

Warren is located in the Macquarie Valley to the west of Narromine. It is the most remote of the case study regions. With lower rainfall, the agriculture activities become more extensive with less cropping activities and a higher dependence on grazing. It is the smallest region in the case studies in terms of economic activity and employment.

Irrigation activities are based on water supplied from the Macquarie River. The Macquarie Marshes wetlands are within the Shire. These represent a significant and world-ranked attraction but at this stage has small significance to the local economy.

5.1 DEMOGRAPHIC CHARACTERISTICS

5.1.1 Population

The trends in population and employment are shown in Table 5-1. The population has been in steady decline for some decades and decreased by 376 between 2001 and 2006. There has been a corresponding decline in employment by residence.

Table 5-1: Population and Employment Summary Warren

Census Year	Resident Population	Employment by Residence	Employment by Workplace	Net Commuting to Work
1981	4,000	1,789	na	na
1991	3,690	1,641	na	na
2001	3,197	1,527	1,390	158
2006	2,750	1,287	1,105	182

Employment by workplace has also declined in the 2000s, continuing the trend from the past but also from the pressure of drought. There is a significant amount of commuting by Warren residents into other areas beyond the shire. This can be a regular arrangement that spills over shire boundaries. The increase in 2006 may be drought related with most of the commuters working elsewhere in agricultural activities. The remoteness would preclude significant commuting to non-primary industries located in towns.

The age profile for Warren is shown in Figure 5-1. Relative to the NSW pattern, Warren has a higher proportion in the under 10 age groups and the over 40 age

groups. This suggests that the birth rate is higher than for NSW as a whole. The retention of older people and the general ageing trend results in a higher proportion in the older groups.

Figure 5-1: Age Profile, Warren 2006

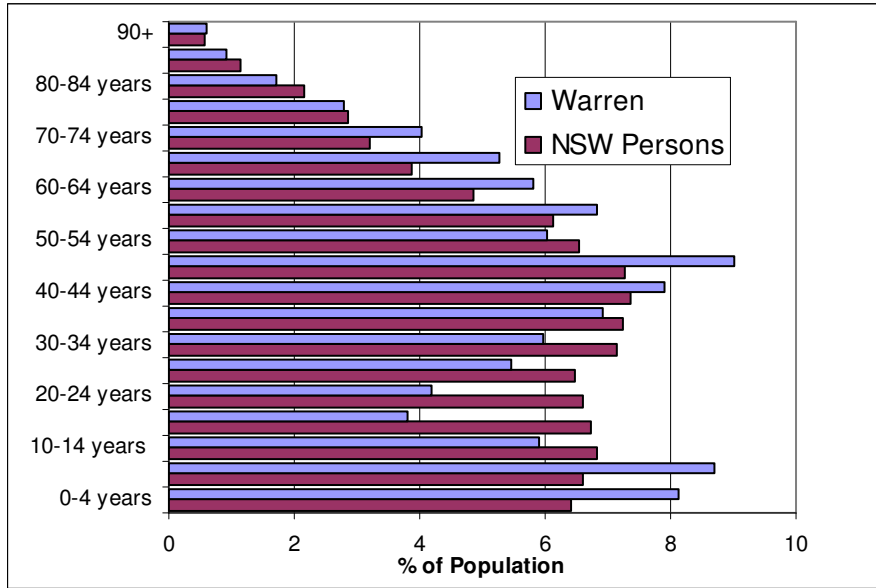
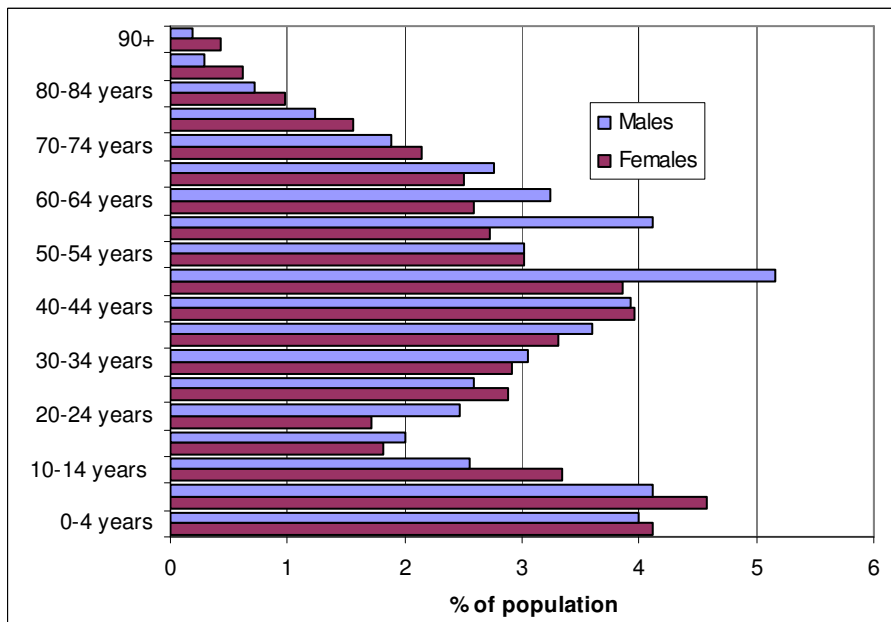


Figure 5-2: Age Profile by Sex, Warren 2006



There is a smaller share of the population in the 10 to 35 year age groups. This can be linked to young people leaving the region to undertake education and find

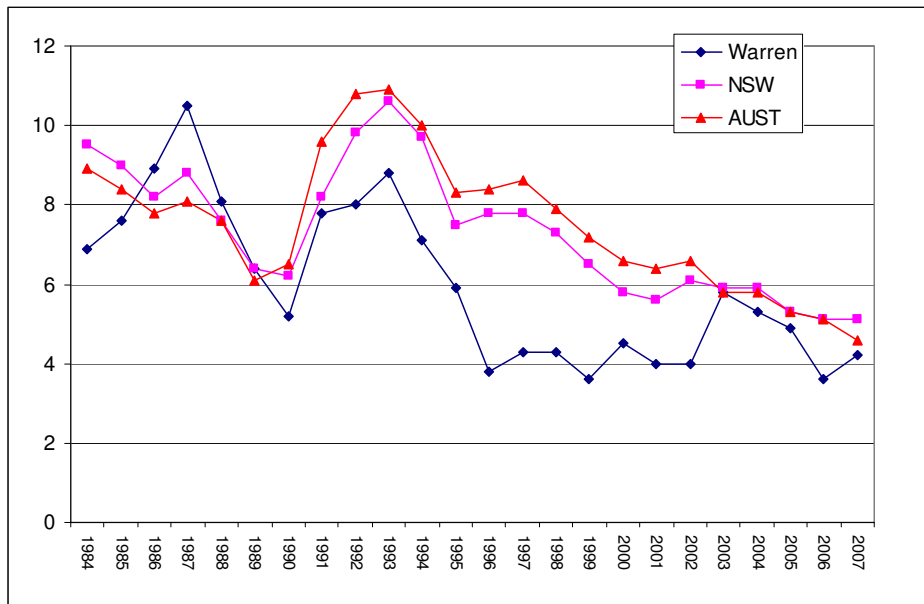
employment opportunities in other regions. The future employment situation in the region could be difficult as the retirement of older people exceeds the accession of new people to the workforce.

The share of males within the region varies among the age groups with a tendency for males to outweigh females in some retirement groups and the early working ages of 15 to 24. It appears that there is a higher tendency for young females to leave the region.

5.1.2 Employment

Unemployment in Warren is shown in Figure 5-3. Since the early 1990s the unemployment rate has been lower than in NSW and has been at minimal levels for the past decade. It would seem that the out-migration of people from the region would have been a factor in the low rate of unemployment.

Figure 5-3: Unemployment, Warren



5.1.3 Household Income

The source of household income for Warren is shown in Table 5-2. Overall, the average income is 16 per cent lower than the NSW average. Relative to NSW, there is a higher share of income from own unincorporated businesses, government benefits and investment income. More recent comparable household income data are not available. It is likely that the level of income is

lower in 2005-06 because of drought, but the composition would remain similar to that of 2001

Table 5-2: Composition of Household Income, Warren

Income Source	Warren	Percentage	NSW	Percentage
Wages and Salary (\$m)	37.50	63	99,869	72
Own Unincorporated Business (\$m)	9.10	15	8,733	6
Investment (\$m)	5.90	10	12,121	9
Superannuation and Annuity (\$m)	0.40	1	2,962	2
Government cash benefits (\$m)	6.90	12	13,919	10
Other income (\$m)	0.10	0	1,203	1
Total income from all sources (\$m)	59.90	100	138,808	100
Net Tax (\$m)	12.50	21	31,389	23
Average weekly household Disposable Income (\$)	754.00		895.00	

5.2 ECONOMIC STRUCTURE AND TRENDS

The information in this section is built mainly on analysis of the detailed employment data collected every five years as part of the population census. Other data are taken from the input-output table for the region compiled for this project. These are shown in Table 5-3.

Table 5-3: Summary Measures of the Warren Economy

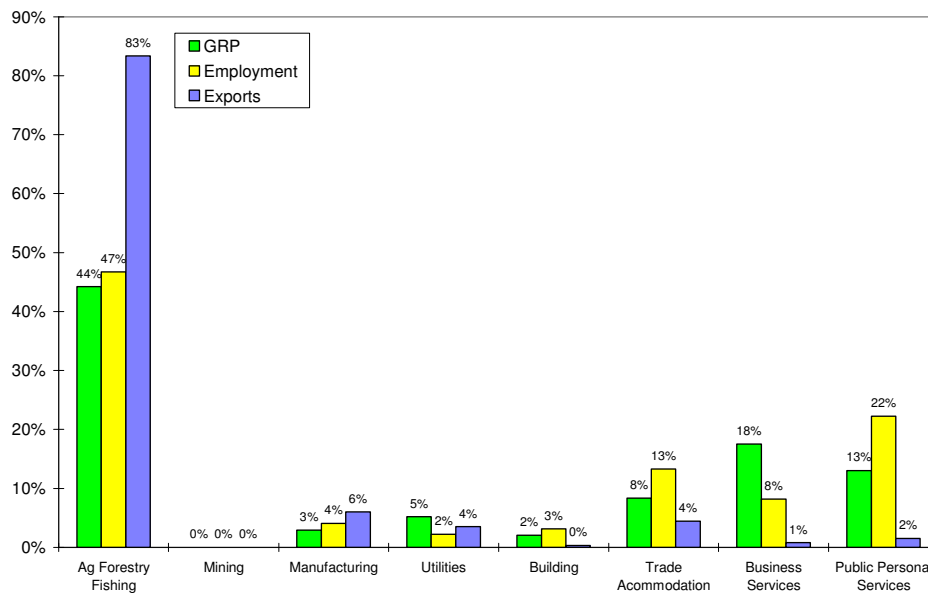
Regional Economy Measures: Warren	Value 2005-06
Gross Regional Product \$m	110
Population 2006	2,750
GRP/capita \$	40,000
Exports \$m	102
Exports share of GRP %	93
Imports \$m	101
Imports share of GRP %	92
Trade Balance \$m	1
Household Employment Earnings \$m	42
Household Expenditure \$m	83
Household Balance \$m	-41

The key features of these data are:

- The GRP and the GRP per capita are relatively low because of the effects of drought. It is not easy to estimate how much below normal this might be but it could be at least 20 per cent. Conditions became even more difficult in the years subsequent to 2005-06.
- Warren is a relatively open economy with both exports and imports representing a high proportion of GRP. Most consumer goods and the materials used in key industries such as agriculture are imported. These measures reflect the limited diversity of the Warren economy. Normally, exports would exceed imports.
- The earnings from employment are estimated to be \$42m, well below the level of household expenditure (by \$41m). The difference will be made up from other sources of income including welfare payments, withdrawals from savings and superannuation, earnings from investments, the operating surpluses from owner-operated businesses and borrowings. Household expenditure is boosted by the inclusion of an imputed value for owner-operated dwellings. The poor seasonal conditions would be exacerbating this deficiency.

A perspective of the structure of the economy is shown in Figure 5-4. This highlights the dominance of primary industries especially in exports. There are limited shares attributed to mining, manufacturing (other than those associated with agriculture), utilities and building. Most of the other economic activity is associated with a full range of services. Warren has little exposure to mining and energy production at this time.

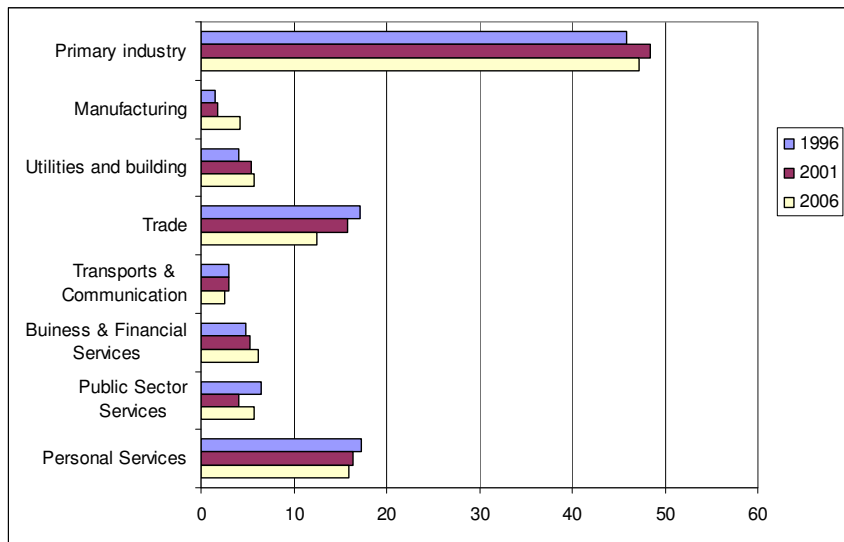
Figure 5-4: Industry Structure of the Warren Economy 2006



5.2.1 Composition of Employment

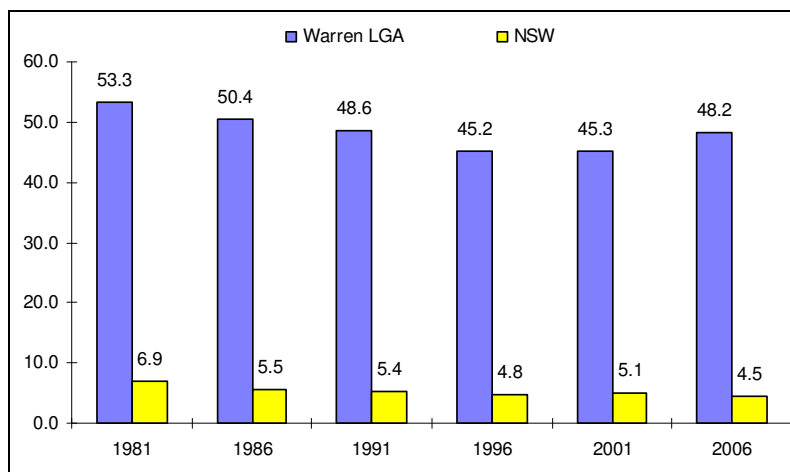
There is a high degree of stability in these broad industry shares. Over the past decade, there has been a decline in the share for primary industry and small gains across manufacturing, utilities and services as indicated in Figure 5-5.

Figure 5-5: Industry Composition of Employment, Warren (%)



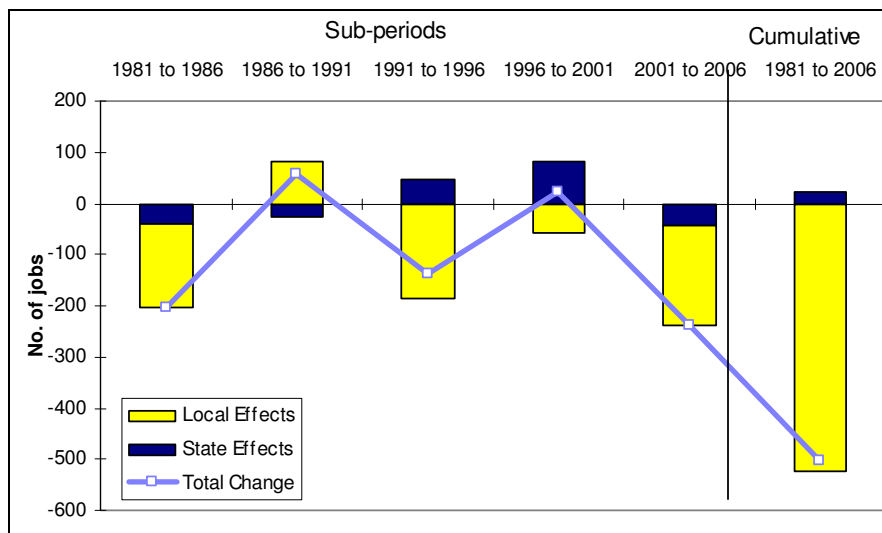
The implication from these data is the limited progress made toward a diversified economy less exposed to the instability associated with primary production and commodity markets. The index shown in Figure 5-6 shows a small decline since 1981 and has increased in the 2000s as some businesses have closed. (The index ranges from 100 for a one industry economy to 0 for the Australian economy.)

Figure 5-6: Index of Specialisation, Warren



Second, with little or negative change in employment, economic growth is limited to that from rising productivity. While this has been relatively strong in agriculture, it is less so for the remaining industries on a national level. Thus, the result is that the growth in the Warren economy is lagging behind that of the NSW and the nation. A summary of the shift-share analysis is shown in Figure 5-7.

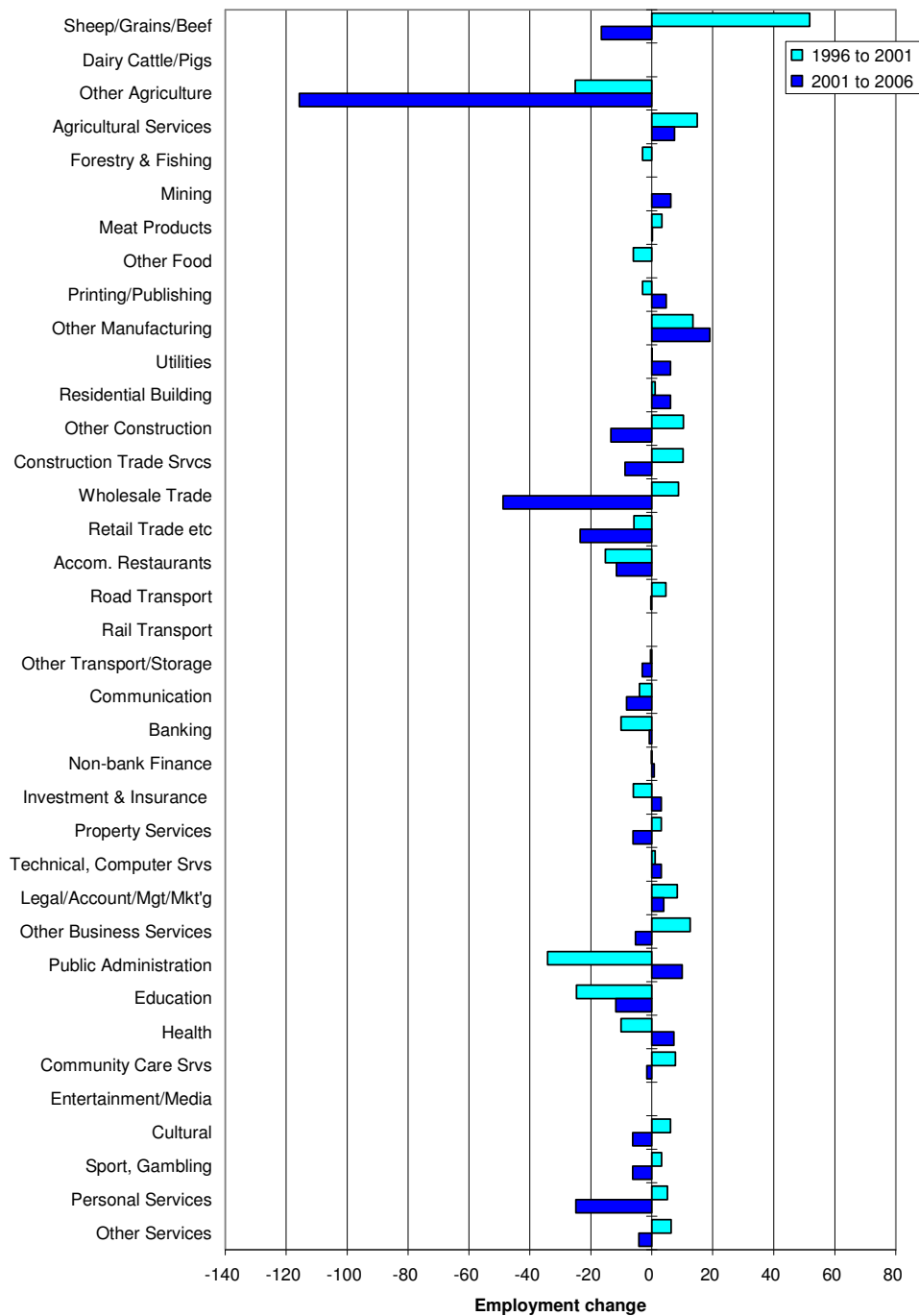
Figure 5-7: Warren Growth relative to NSW Growth



The shift-share analysis benchmarks Warren against the performance of the NSW economy. If Warren had kept pace with NSW, then over the 1981 to 2006 period, it would have about 20 more employees (the dark blue segments). In reality, the change is shown as the “total change” and indicates a decline of 502 jobs. Thus, over the 25 years, Warren has lost its share of the NSW economy by the equivalent of almost 520 jobs (relative to present employment of about 1300). In 2006, Warren is around 40 per cent smaller than it would have been if it had kept pace with the NSW economy. Finding new growth opportunities for growth is a high priority strategic issue and will mainly lie in non-agricultural industries.

The shift-share analysis of employment also ranks industries in terms of their growth as indicated by the employment change over five years shown in Figure 5-8. The two periods represent a considerable contrast with the period 1996 to 2001 showing some growth in employment from a relatively low base in 1996 when the after-effects of drought were significant. The growth in employment was concentrated in agriculture, other manufacturing, building and construction, and some services reflecting an improving business and household income situation. Those growth areas were offset to some degree by rationalisations in public sector activity such as banking and public funded activities of public administration and education.

Figure 5-8: Changes in Employment 1996 to 2006



The situation in the 2001 to 2006 period was dominated by poor seasonal conditions that reversed the gains made in the previous five years and then some. There were widespread losses in employment in agriculture and related activities such as trade and road transport with losses in construction and some business services. This highlights the need for nurturing diversity and robustness

into the economy - a considerable challenge but there may be some opportunities in areas where there is evidence of industry strength including:

- The development of services for households to minimise the leakages of expenditure from the Warren area.
- The development of a suite of activities relating to the growth of visitation to the Macquarie Marshes area.
- The development of some individual businesses that have the capacity to service needs of locals and to export into other markets.

5.2.2 Agriculture

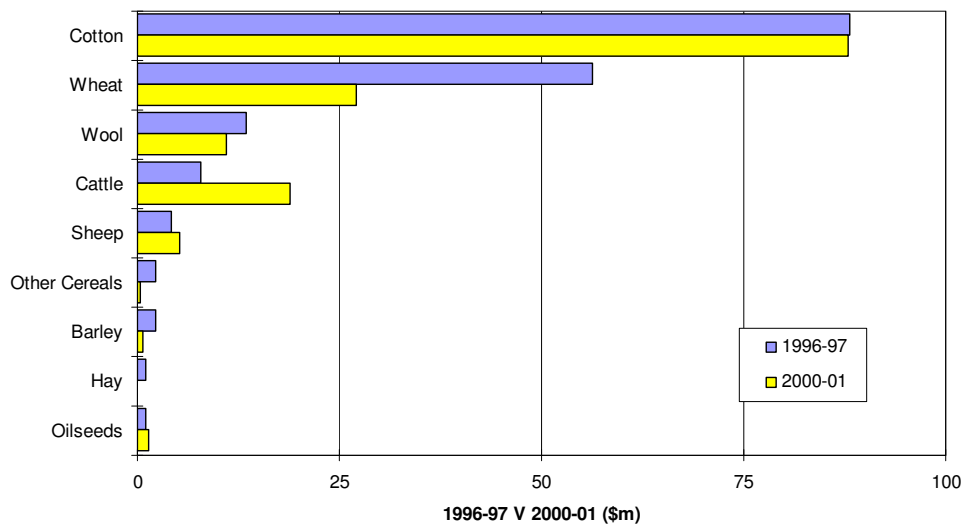
Agricultural production is a key factor in the performance of the Warren economy. The value of production is indicated in Table 5-4 including some estimates for 2005-06 that may prove to be conservative. But they will be below what would be considered to be normal and are a major factor in the slowdown in the Warren economy. The severe effects of the drought were beginning to emerge by mid 2006 and in the successive years resulted in levels of agricultural production below that of 2005-06. These events highlight not only the high dependence on agriculture, but a high level of specialisation within agriculture on cotton and wheat. There is a significant and likely growing production of cattle while sheep and wool production continues to be significant.

Table 5-4: Gross Value of Agricultural Production, Warren

Warren	1996-97	2000-01	2005.06
Commodity	\$m	\$m	\$m
Cotton	88	88	40
Wheat	56	27	35
Wool	13	11	12
Cattle	8	19	17
Sheep	4	5	
Other Cereals	2	0	
Barley	2	1	
Hay	1	0	
Oilseeds	1	1	
Total	177	153	104

Note: 2005-06 estimates by CARE and subject to revision.

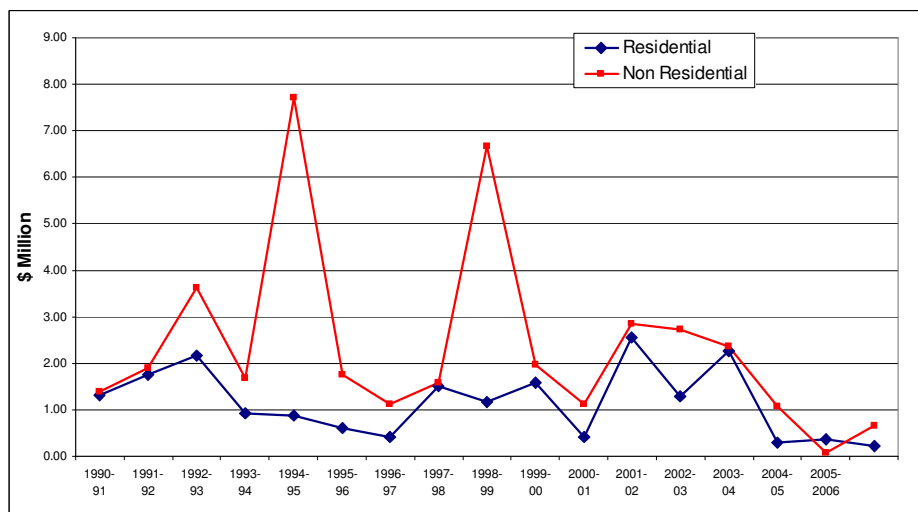
Figure 5-9: Gross Value of Agricultural Production, Warren



5.2.3 Building

Residential construction is an indicator of population growth while non-residential construction is an indicator of the overall level of business investment. Building data for Warren are shown in Figure 5-10. Residential building is low but relatively stable between 1990 and 2003. Since then building has been negligible under the influence of continuing drought conditions. Non-residential construction is highly variable with some spikes in the 1990s, but otherwise it is at a low level.

Figure 5-10: Building Approvals Warren



5.2.4 Service Delivery Levels

A benchmarking process for measuring the level of services in a region is to calculate for each industry the ratio between the population and the number employed in the particular service industry (known as a Population Employment Ratio – PER). For Warren, these are shown in Figure 5-11 for each of the main service industries as a ratio of the average level for NSW. A value of 100 indicates parity with the NSW average.

Figure 5-11: Service Delivery Index, 2006 Warren

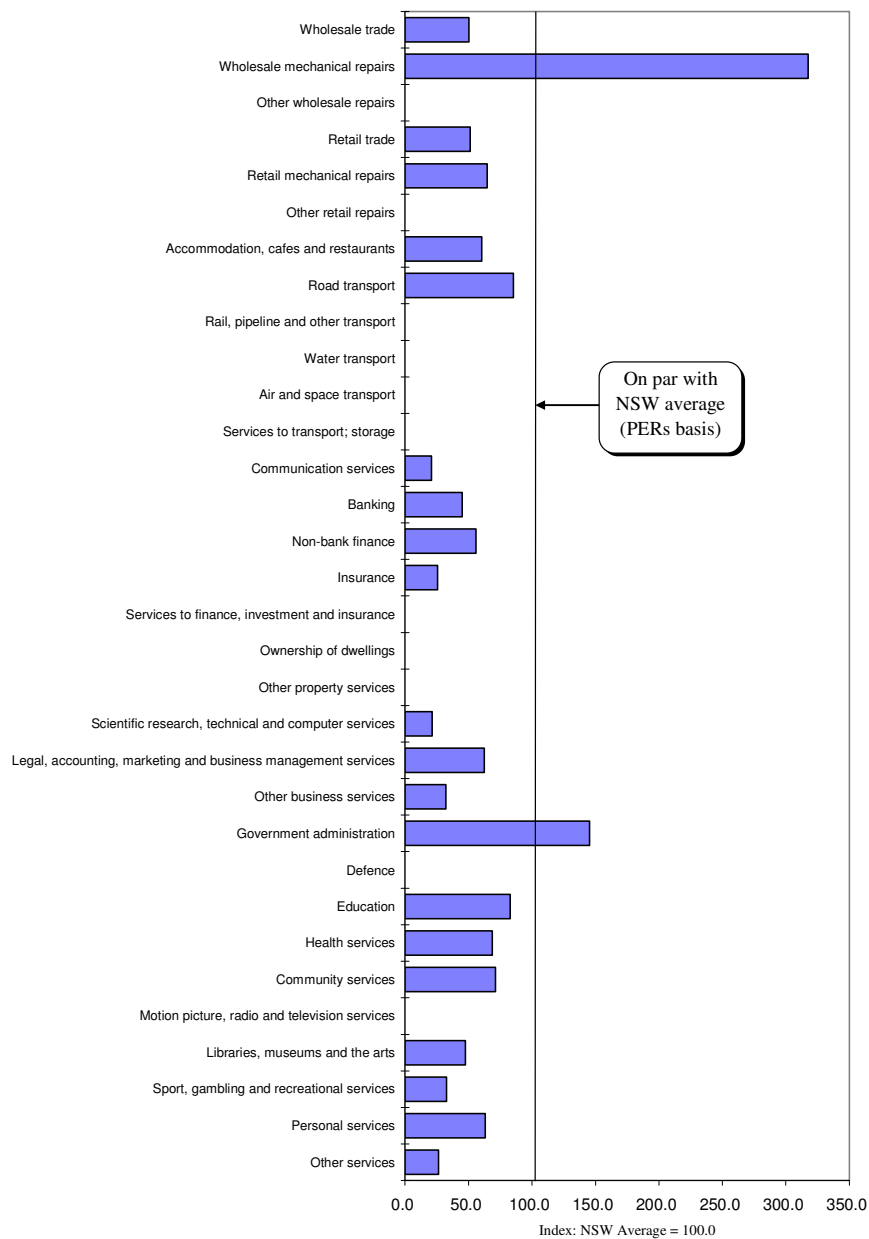


Figure 5-11 highlights how 'thin' these remote economies are:

- Only mechanical repairs and government administration exceed the NSW level (and by a substantial amount).
- The level of wholesale trade is low, reflecting the impact of the drought on agricultural traders.
- The low retail trade value is indicative of the high level of leakages of household expenditure from the region. That is pointing to an opportunity but a difficult one.

An analysis of the types of retail and other services that are appropriate for a centre such as Warren is needed to build an appropriate strategy. Such as has occurred with recreational facilities. There is a need to find an approach to the provision of business services and to seek ways to obtain a higher level of servicing in education, health and community care that are all well below the NSW level.

5.3 COTTON AND THE WARREN ECONOMY

The Warren economy is represented in the form of an input-output table. The table is a preliminary one given that the ABS estimates of the gross value of agricultural production for 2005-06 are not yet available. It provides a structure that can be used to compare economies over time in a consistent way. It is also used to derive multipliers that estimate the flow-on impacts associated with the cotton industry.

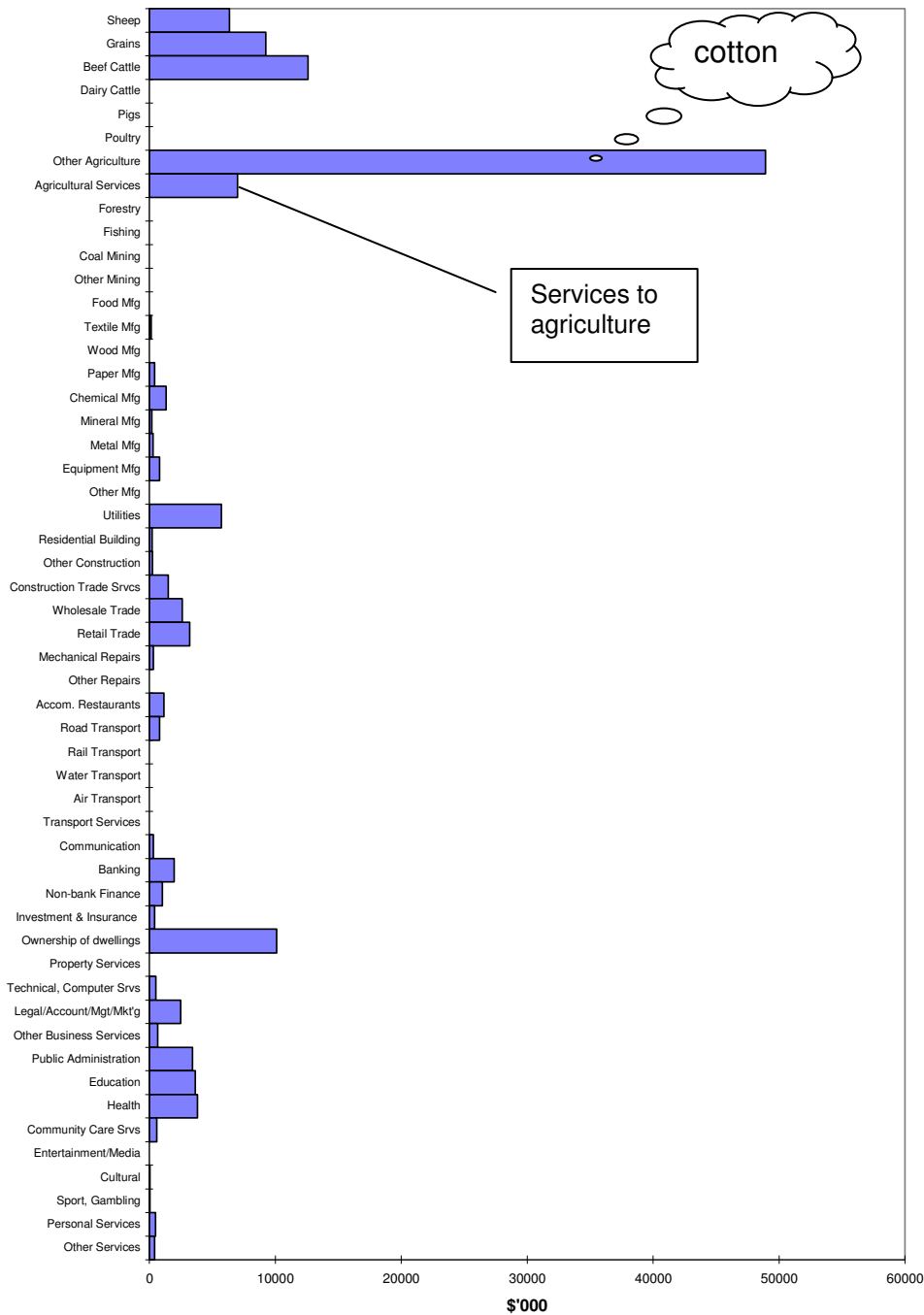
There are a number of ways to present some summaries of the information derived from the input-output table. In this case, a chart showing the industry contributions to GRP is shown in Figure 5-12. This is an aggregated version of information that includes 109 industries.

The features shown by this figure include:

- The dominance of the agricultural industries is apparent, even in a period when the value of agricultural production has been depressed because of drought. This table shows the cereal crops harvested in late 2005 and the cotton crop harvested in 2006. The latter was low and conditions in mid 2006 were indicating poor winter crops and low water availability for the next irrigation season. As a result, the economy was already slowing rapidly by the end of the 2005-06 year (when the population census was taken).
- The cotton industry and services to agriculture are important contributors even though they are dwarfed by grain production in a regular season.

- Services to agriculture is also an important industry that is closely linked to cotton as it includes a range of crop husbandry operations, contract harvesting and cotton ginning. Many of these activities were subsequently reduced with smaller cotton crops.

Figure 5-12: Industry Contributions to the Warren Economy



- The rental value and imputed value of owner-operated housing is one of the largest contributors to GRP. Inclusion of these values is conventional and helps to show the real value of those economic activities to residents.
- The other key industries are those relating to trade. Wholesale trade is significant as it handles much of the agricultural production. The wholesalers tend to have variable employment depending on the level of agricultural production.
- Those sectors with substantial public funding, education, health and community care are also important. Utilities also play a significant role.

5.3.1 The Economic Impacts of the Cotton Industry

The analysis is shown for cotton growing. There were no cotton research activities designated for the Warren Shire. The input-output model is used to calculate multipliers to estimate the flow-on effects. The multipliers are shown in the Attachments to this section.

A summary of the impacts for cotton growing is provided in Table 5-5. These show the direct, flow-on and total impact of cotton growing. Cotton production had a direct impact shown as \$40m of gross output. This generated value added of \$13m, employment of 90 people who received income from employment of just over \$2m.

Table 5-5: Warren, Cotton Growing Impacts

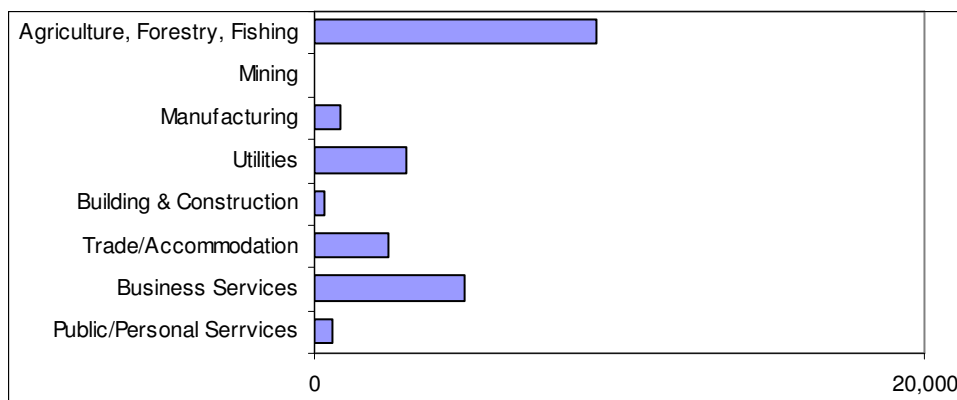
WARREN COTTON GROWING IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	39,916	18,012	3,306	21,318	61,234
Value-Added (\$'000)	13,218	9,017	2,147	11,164	24,382
Household Income (\$'000)	2,357	4,431	759	5,190	7,547
Employment (no.)	90	76	18	95	185

The total impact estimates of value added were \$24m, 185 jobs earning almost \$8m for their households. The flow-on effects are concentrated in the production category and reflect the large amount of services that are purchased by growers from other specialists. This includes cotton ginning, consultants and contracted farm operations such as spraying. Relatively few impacts accrue from the purchase of materials as most of those are imported with local distribution margins accruing locally.

The distribution of the flow-on impacts by broad industry groups is shown in Figure 5-13 (further industry details are included in an Attachments). This highlights the heavy concentration on the agriculture services activities and the

use of a range of business and trade services. There are few flow-ons to manufacturing from within the cotton industry itself, or via the consumption-induced effects. The latter is a reflection of the limited local production of manufactured consumer goods.

Figure 5-13: Distribution of Flow-on Effects by Broad Sector (\$'000)



Relative to the Warren region, the total impact of cotton growing amounts to

- 31 per cent of gross output
- 22 per cent of value added
- 19 per cent of employment and
- 16 per cent of household income from employment.

5.4 SUMMARY

Warren is the smallest and most remote cotton community in the case studies. It has a high dependence on agriculture and cotton is a large part of that impact at around 20 per cent in 2005-06. It would be higher in terms of an 'average' season.

These conditions make for a vulnerable economy, although many of the businesses have high resilience. The size constrains the range of business opportunities and there are few opportunities for new commercial developments. Warren has no known mining or energy developments to boost those prospects. The development of an economy that is less dependent on agriculture is a real challenge. The potential of the Macquarie Marshes as an attraction is yet to be developed. Some relevant lessons can be learned from the developments of the Okavango wetlands in Botswana.

ATTACHMENTS

Cotton Growing Multipliers

WARREN COTTON GROWING MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.451	0.083	0.534	1.534	1.534
Value-Added (\$)	0.331	0.226	0.054	0.280	0.611	1.845
Household Income (\$)	0.059	0.111	0.019	0.130	0.189	3.202
Employment (no./\$m)	2.3	1.9	0.5	2.4	4.6	2.051

Impact Distribution Ranked by Industry: Warren Cotton Growing

Warren: Cotton Industry Output Impacts	Ranked Flow-on	
Sector	\$'000	%
Services to agriculture; hunting and trapping	9,189	43.1
Water supply; sewerage and drainage services	2,701	12.7
Road transport	1,819	8.5
Wholesale trade	1,162	5.5
Ownership of dwellings	1,085	5.1
Legal, accounting, marketing and business management services	724	3.4
Basic chemicals	658	3.1
Retail trade	647	3.0
Banking	608	2.9
Accommodation, cafes and restaurants	351	1.6
Electricity supply	292	1.4
Non-bank finance	259	1.2
Retail mechanical repairs	196	0.9
Education	193	0.9
Construction trade services	176	0.8
Health services	172	0.8
Scientific research, technical and computer services	170	0.8
Other construction	124	0.6
Insurance	115	0.5
Government administration	91	0.4

6. THE DARLING DOWNS

The Darling Downs cotton growing area is extensive and is mostly in the Condamine River catchment. The main centre servicing the technical requirements of the cotton industry is Dalby with Toowoomba as an alternate supplier. Toowoomba is the premier retail and service centre for the region.

The cotton ‘community’ of the Darling Downs extends over several local government areas (in terms of the old boundaries) mostly in Wambo Shire with smaller areas in the west of Jondaryan Shire and in the north-east of Millmerran Shire (Cecil Plains). The analysis has included the four old local government areas (Jondaryan, Millmerran – now part of Toowoomba Region Council, and Dalby and Wambo – now part of Dalby Regional Council). The four councils have also been analysed as a region while Dalby and Wambo have been considered as one combined area. The following includes information from all of these analyses to provide a local and regional perspective and identify the role that cotton plays in the region. This structure has been necessary to make practical the reference in the brief to “Cecil Plains and Dalby”.

The region has been a prime agricultural cropping area with relatively good connections to the main urban areas of South-east Queensland. In the past decade, the energy potential of the region has provided another focus for development. That has resulted in a coal-fired power station, the development of smaller gas-fired generators, the production and export of coal and coal-seam gas and the development of infrastructure to service those projects. These developments have added considerably to the growth momentum of the region. The developers are all major corporations with a limited regional presence.

6.1 DEMOGRAPHIC CHARACTERISTICS

6.1.1 Population

The Darling Downs is a growing region with all three LGAs gaining population and employment apart from Millmerran in the 2000s (Table 6-1). Millmerran is a special case having a large gain in construction employment to 2001 associated with building a power station and coal mine while in 2006, those construction workers have been replaced by a lesser number of power station and mine operators. Apart from the power station it seems that the population and employment in Millmerran is steady.

Dalby-Wambo and Jondaryan are areas where there is considerable net commuting to other centres (including Toowoomba), while Millmerran has net commuting into local employment, although at a reduced rate in 2006. There has

also been a large reduction in net commuting from Jondaryan given the large growth in local employment.

Net commuting out from Dalby-Wambo is to jobs in agriculture, electricity, meat processing, building and road transport. There is a net commuting in of education and health workers. Jondaryan has a substantial array of industries for those commuting out (mainly to Toowoomba) while there is net commuting in to work in meat processing, other agriculture, aircraft manufacture, machinery manufacture, wholesale trade, road transport and defence.

Table 6-1: Population and Employment Summary, Darling Downs

Census Year	Resident Population	Employment by Residence	Employment by Workplace	Net Commuting to Work
Dalby-Wambo				
1991	14,554	6,381	na	na
2001	14,759	6,652	6,551	101
2006	15,007	6,880	6,570	310
Jondaryan				
1991	10,293	4,630	na	na
2001	12,400	5,838	4,495	1,343
2006	14,096	6,933	6,396	537
Millmerran				
1991	3,014	1,368	na	na
2001	3,388	1,558	1,784	-226
2006	3,093	1,416	1,484	-68

The age profiles are shown in Figure 6-1. These compare the age profile with that for Queensland and there is a comparison between males and females. The following general points emerge from those charts:

- Dalby as an urban centre is close to the same pattern as that for Queensland as a whole.
- The three 'rural' areas have a gap in the distribution that shows a reduced share of people in the 20 to 34 year age groups relative to Queensland.
- In all areas, the birth rate seems to be higher than Queensland as indicated by the higher shares in the 0 to 14 year age groups.
- The ageing tendency is strongest in Millmerran and Wambo
- There seems to be a tendency for more young females to leave resulting in a trend for there to be more males in the 20 to 34 year age groups.

The distinction between Dalby and the surrounding areas is notable. Dalby has been growing and attracting new residents and workers that have been able to fill the 'gap' in the age profile that is evident in the other areas. Some of those new residents may have come from the surrounding rural areas.

Figure 6-1: Age Profiles, Darling Downs

Region and Queensland

Males and Females

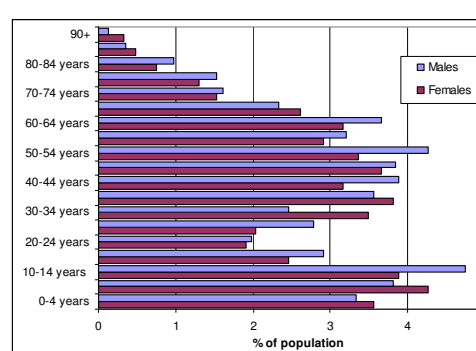
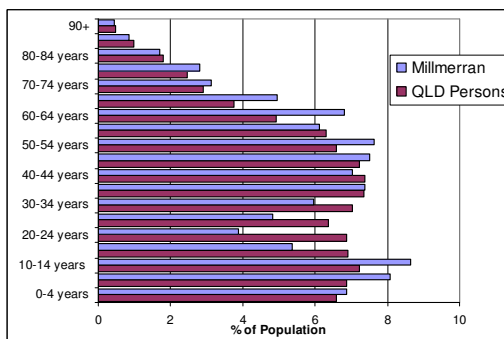
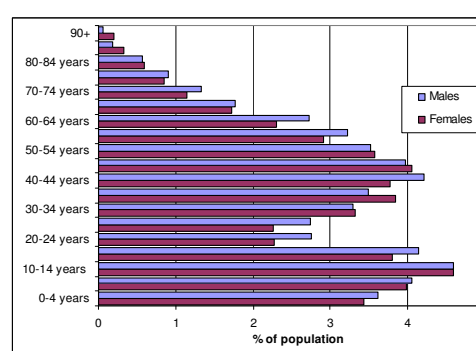
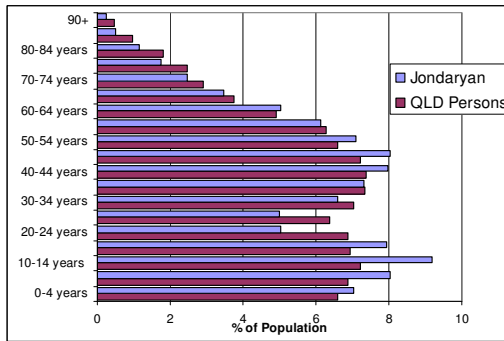
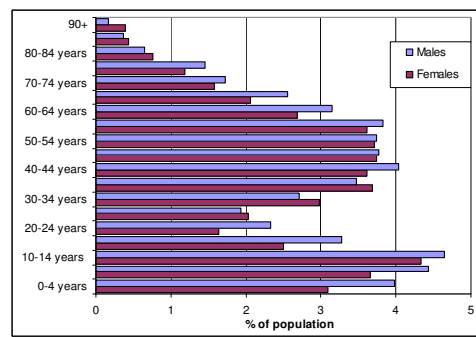
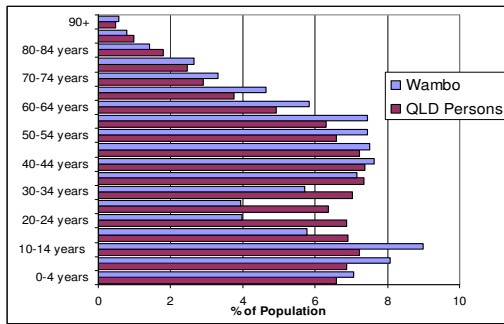
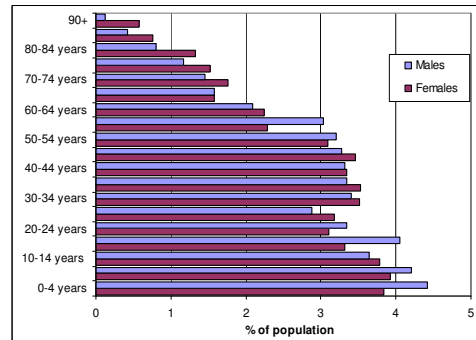
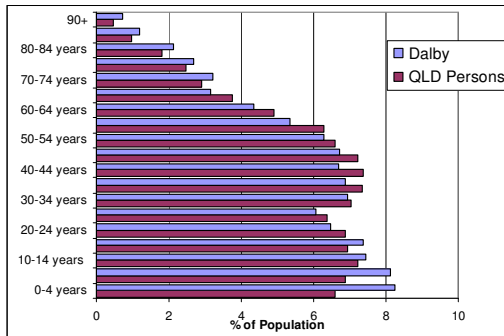
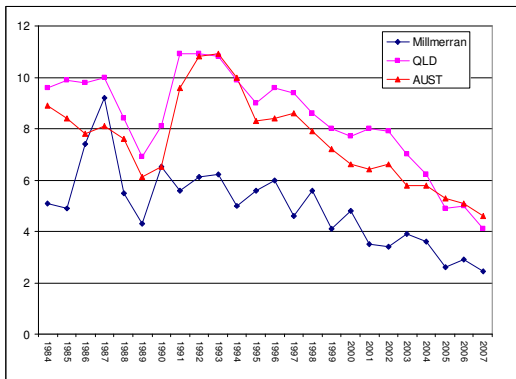
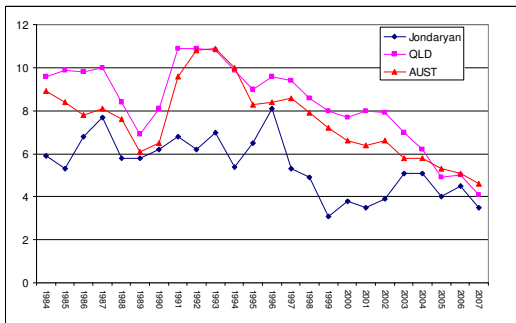
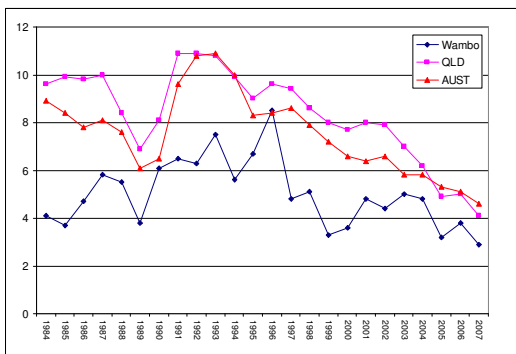
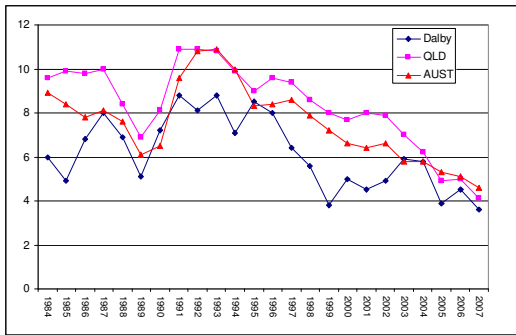


Figure 6-2: Unemployment, Darling Downs



6.1.2 Unemployment

Unemployment in all of the Darling Downs regions has been consistently better than the Queensland and national level for most of the last two decades. That situation remains and seems likely to continue as the region continues to have high economic growth (Figure 6-2). Millmerran, the most rural and remote has had least unemployment.

The low unemployment reflects this area as one of the high growth areas in Queensland. Even so, there appears to be a considerable out-migration of young people from the region as indicated by the age profiles above. A high level of migration of working-age people to the region may be offsetting the loss of young people.

6.1.3 Household Income

The level and source of household income for the four areas is shown in Table 6-2. What is notable about the household income data is the general similarity among the four locations in terms of the level and the composition relative to Queensland. First, there are only small differences between the household disposable income in the regions and Queensland. Second, the composition does not vary much from each other or from the Queensland average. The similarity appears to be driven by proximity to the main urban area of south-east Queensland, and by the considerable manufacturing and high level services that exist within the region. This region seems to be taking on more of the characteristics of a major urban area and leaving behind those of a predominately rural area.

Table 6-2: Composition of Household Income, Darling Downs

Income Source	Dalby	Percentage	QLD	Percentage
Wages and Salary (\$m)	115.10	71	45,882	71
Own Unincorporated Business (\$m)	9.90	6	4,527	7
Investment (\$m)	13.20	8	4,389	7
Superannuation and Annuity (\$m)	1.70	1	1,344	2
Government cash benefits (\$m)	21.90	13	8,214	13
Other income (\$m)	0.50	0	409	1
Total income from all sources (\$m)	162.30	100	64,765	100
Net Tax (\$m)	29.00	18	12,432	19
Average weekly household Disposable Income (\$)	731.00		772.00	

Income Source	Wambo	Percentage	QLD	Percentage
Wages and Salary (\$m)	50.60	65	45,882	71
Own Unincorporated Business (\$m)	7.70	10	4,527	7
Investment (\$m)	6.20	8	4,389	7
Superannuation and Annuity (\$m)	0.80	1	1,344	2
Government cash benefits (\$m)	12.60	16	8,214	13
Other income (\$m)	0.30	0	409	1
Total income from all sources (\$m)	78.20	100	64,765	100
Net Tax (\$m)	12.70	16	12,432	19
Average weekly household Disposable Income (\$)	692.00		772.00	

Income Source	Jondaryan	Percentage	QLD	Percentage
Wages and Salary (\$m)	134.20	71	45,882	71
Own Unincorporated Business (\$m)	12.60	7	4,527	7
Investment (\$m)	11.30	6	4,389	7
Superannuation and Annuity (\$m)	4.20	2	1,344	2
Government cash benefits (\$m)	25.60	14	8,214	13
Other income (\$m)	0.09	0	409	1
Total income from all sources (\$m)	188.80	100	64,765	100
Net Tax (\$m)	32.60	17	12,432	19
Average weekly household Disposable Income (\$)	745.00		772.00	

Income Source	Millmerran	Percentage	QLD	Percentage
Wages and Salary (\$m)	38.80	71	45,882	71
Own Unincorporated Business (\$m)	6.00	11	4,527	7
Investment (\$m)	3.30	6	4,389	7
Superannuation and Annuity (\$m)	0.40	1	1,344	2
Government cash benefits (\$m)	5.90	11	8,214	13
Other income (\$m)	0.10	0	409	1
Total income from all sources (\$m)	54.40	100	64,765	100
Net Tax (\$m)	9.40	17	12,432	19
Average weekly household Disposable Income (\$)	761.00		772.00	

Unfortunately, more recent comparable household income data are not available. It is possible that the level of income may have been lower in recent years in some areas because of drought. The developments associated with the energy industry will be tending to lift household income. The income increasing factors are likely to be strongest in Dalby and Jondaryan where the non-agricultural industries are concentrated. Those areas that are heavily dependent on agriculture are likely to be around the same level. It is likely that the composition of income sources would remain similar to that of 2001.

6.2 ECONOMIC STRUCTURE AND TRENDS

The information in this section is built mainly on analysis of the detailed employment data collected every five years as part of the population census. Other data are taken from the input-output table for the region compiled for this project. In this case, only one table covering the four local government areas has been prepared. While this table is subject to further refinement, some of the main characteristics are indicated in Table 6-3.

The key features of these data are:

- The GRP and the GRP per capita at about \$40,000 are modest and would reflect some drought effects. It is possible that this is an underestimate because of the methods used. In strong growth regions, it is probable that average earnings are higher than in other parts of the country and relative to low growth regions. Information on these differential earnings is not available and so the use of an average for Queensland will keep the estimates low.
- The Darling Downs is a highly productive area in many respects and with a low population will have a high dependence on trade with the rest of the country and the world. Exports are a large part of the regional economy as indicated by them being a high share of GRP. Similarly, relatively little of the capacities of the region are targeted at producing household products, so there is also a high level of imports to fill this need and to provide essential materials for the growing array of industries in the region.

Overall there is estimated to be a trade deficit, primarily because drought has curtailed the level of agricultural production and exports.

Table 6-3: Summary of Measures of the Darling Downs Economy

Regional Economy Measures: Darling Downs	Value 2005-06
Gross Regional Product \$m	1,278
Population 2006	32,196
GRP/capita \$	39,694
Exports \$m	975
Exports share of GRP %	76
Imports \$m	1,128
Imports share of GRP %	88
Trade Balance \$m	-153
Household Employment Earnings \$m	647
Household Expenditure \$m	981
Household Balance \$m	-334

- The earnings from employment are estimated to be \$647m, well below the level of household expenditure (by \$334m). This is likely to be a larger than normal deficit to be made up from other sources. The difference will be made up from welfare payments, withdrawals from savings and superannuation, earnings from investments, the operating surpluses from owner-operated businesses and borrowings. The expenditure estimates are boosted by the inclusion of an imputed value for owner-occupied dwellings.

A perspective of the structure of the economy is shown in Figure 6-3 derived from the input-output table. This highlights the dominance of manufacturing industries especially in exports along with very significant agricultural industries and a growing mining industry. A proportion of the manufactured exports will be processed agricultural products with the most important being beef. There appears to be a growing importance of business services in the region to support the overall business growth that is evident.

Figure 6-3: Industry Structure of the Darling Downs Economy

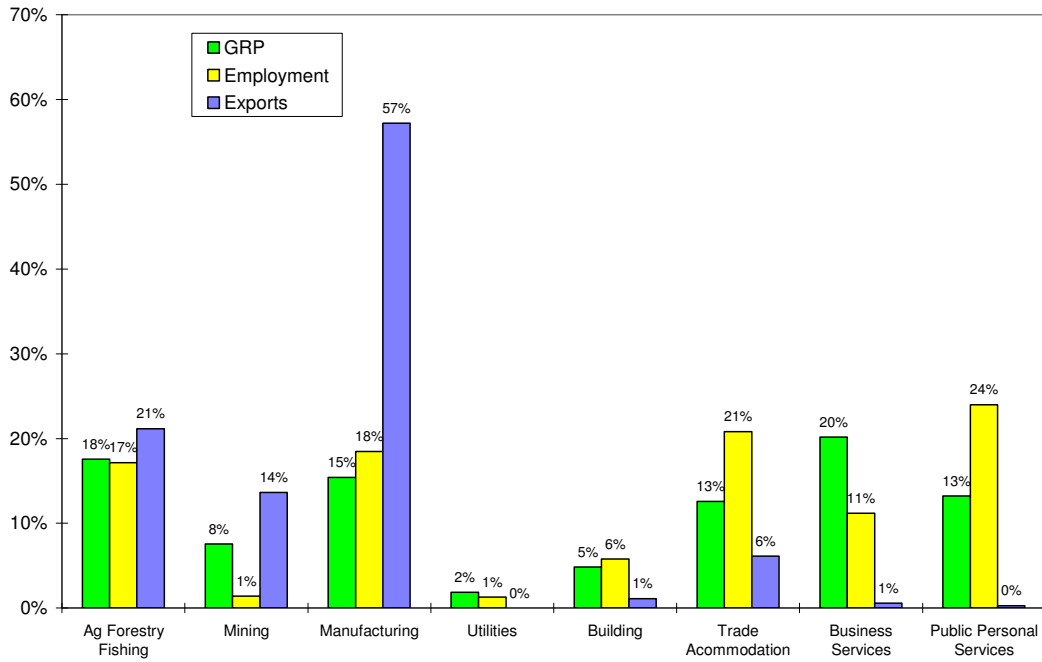
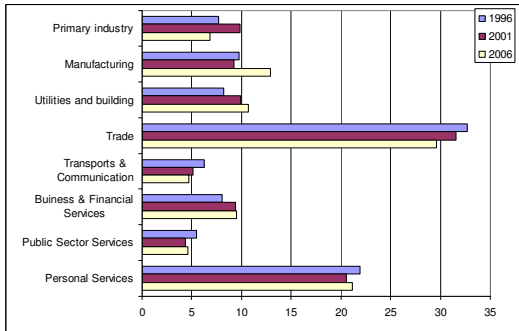
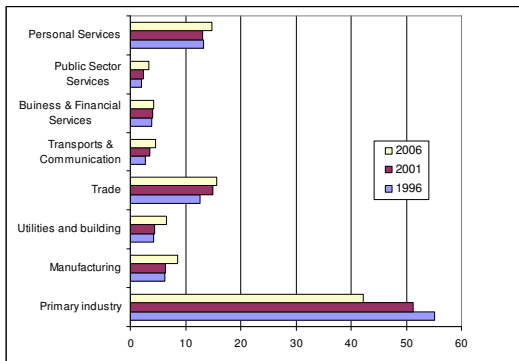


Figure 6-4: Industry Composition of Employment, Darling Downs (%)

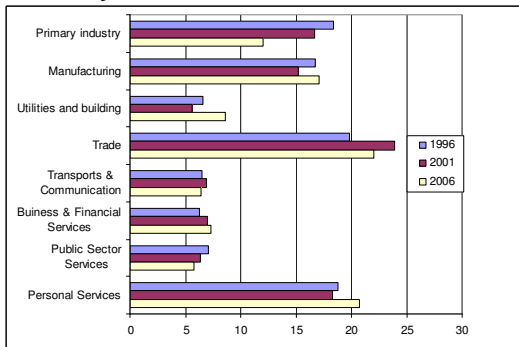
Dalby



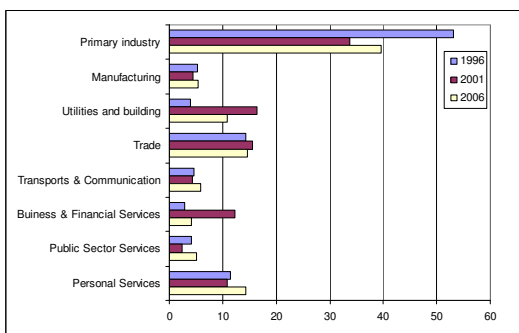
Wambo



Jondaryan



Millmerran



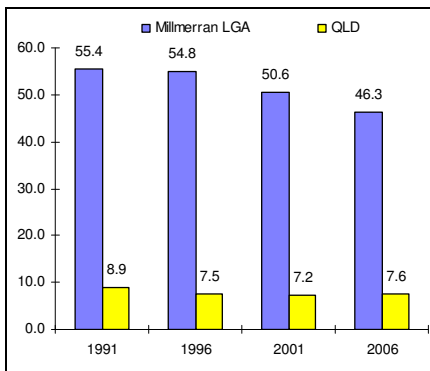
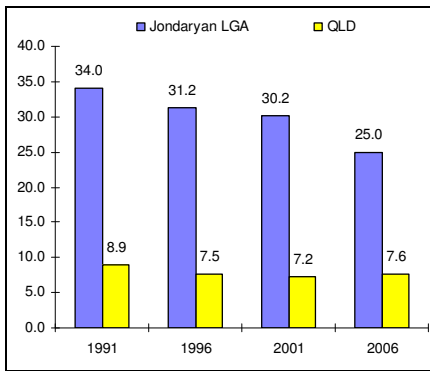
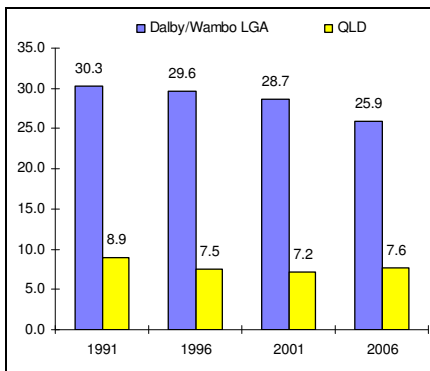
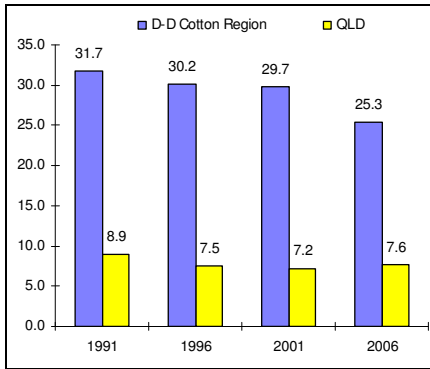
6.2.1 Industry Composition of Employment

There is a high degree of stability in these broad industry shares shown in Figure 6-4. Over the past decade, there has been a decline in the share for primary industry and small gains across manufacturing, utilities and services.

These data highlight the importance of Dalby and Jondaryan as trade centres. Jondaryan and Dalby also stand out as an emerging manufacturing centre. In all regions, primary industry has a declining share although Millmerran has increased to 2006 as the new power station has come online boosting mining and utilities (but reducing construction).

A key point is that these localities and the region as a whole is developing a diversity of industry structure that is shifting it from a rural area to a complex modern and diverse manufacturing and service economy. Those developments are focused on Dalby and Jondaryan, but they spill over to the rural areas of Wambo and Millmerran.

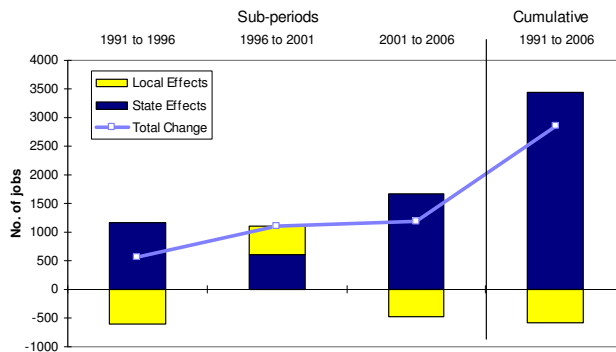
Figure 6-5: Index of Specialisation, Darling Downs



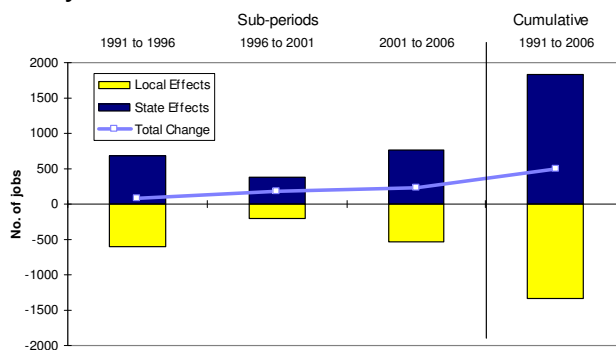
There is an index that is used to provide a measure of the diversity of an economy and that is indicated in Figure 6-5. (The index ranges from 100 for a one industry economy to 0 for the Australian economy.) The results show that all areas and the region have become more diversified with most of the gains coming in the 2000s. Those gains have been concentrated in Dalby-Wambo and Jondaryan. However, a value of 25 is still a relatively high level because the range and depth of manufacturing is still limited (a diverse manufacturing region will have a value under 20), but significant progress has been made in diversifying the economy.

Millmerran has the least diversity. Its value with the power station and the coal mine is still far higher than Dalby-Wambo in 1991. One large project has a smaller impact on the index than the equivalent growth spread across a multitude of smaller industrial operations. The additional income and low volatility of electricity production may underestimate the diversifying impact of that project on the Millmerran region.

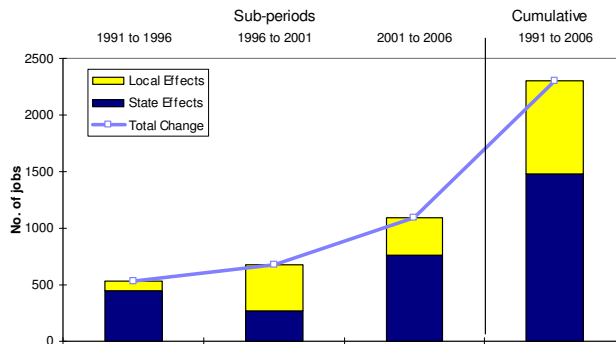
Figure 6-6: Darling Downs Growth Relative to Queensland



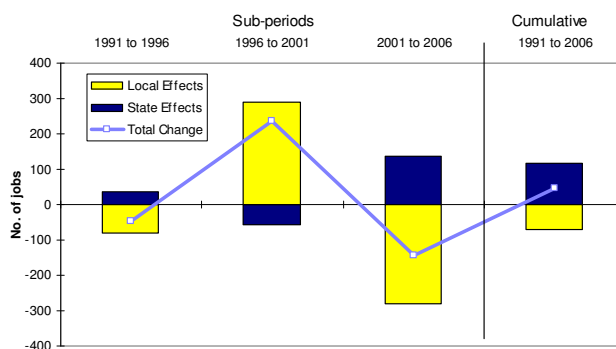
Dalby-Wambo



Jondaryan



Millmerran



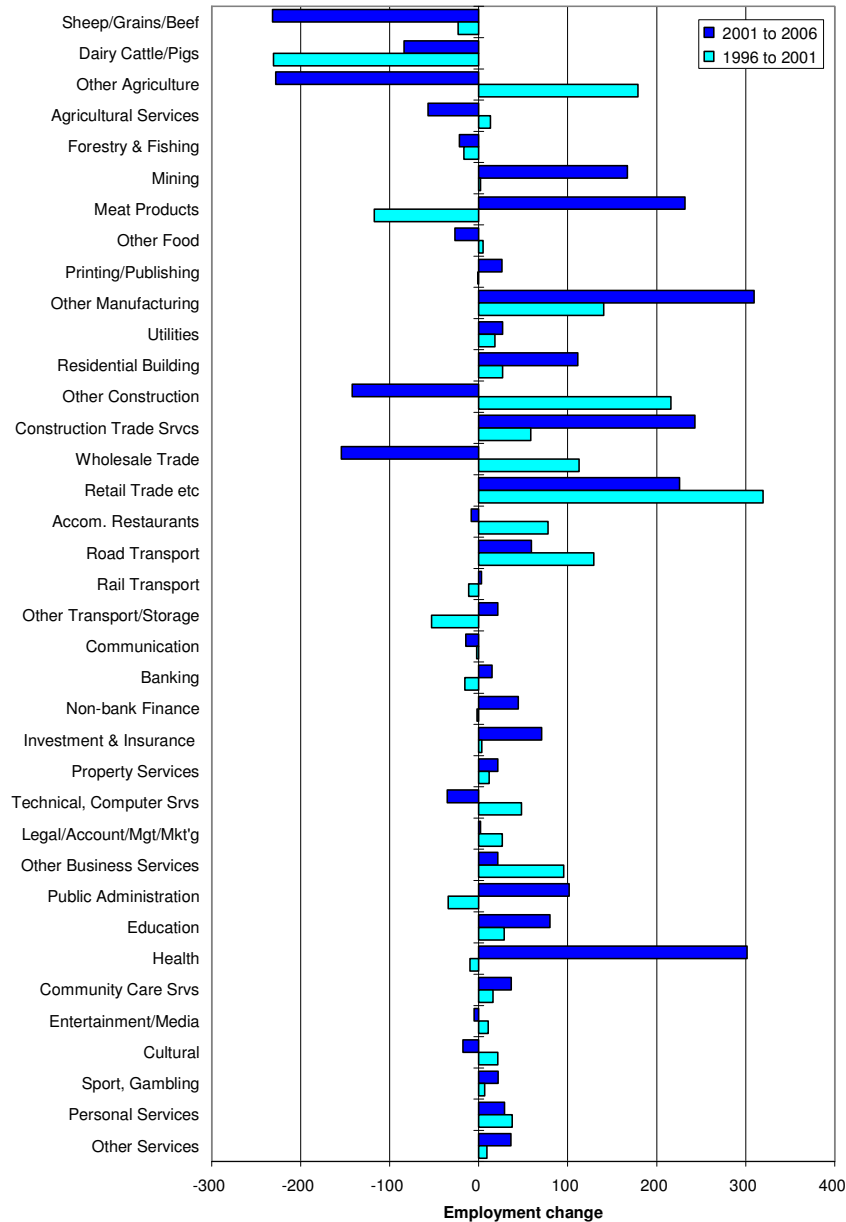
The Darling Downs region is one with growth in population and employment as well as making gains through productivity improvement. It all adds up to high growth. Shift-share analysis enables that growth to be put into the context of growth in Queensland. The results of the analysis are shown in Figure 6-6. In the Darling Downs region, growth has been just short of that required to keep pace with Queensland. This is indicated in the first chart where over 1991 to 2006, the total change is just below the state effect shown in blue.

There are some significant differences among the local areas. At the top of the list is Jondaryan where it has outperformed Queensland over the whole period from 1991 to the extent of about 700 jobs, i.e. about 700 more than if it had just kept pace with the State. While it might be expected that Millmerran would lag behind, it has almost kept up the rate of growth in the State. This reflects the development of coal mining and power generation in recent years. Up to 2001, Millmerran outperformed the State during the construction period. That reversed in the early 2000s with a lesser employment in the operating stage.



Dalby-Wambo has performed well, but even so it is below the level required to maintain its share. In 2006, it was the equivalent of around 1300 jobs behind what it would have been if it had grown at the same rate as the State. Given its structure, Dalby-Wambo would be affected by drought and that may be a large part of the lagging performance up to 2006.

Figure 6-7: Changes in Employment 1996 to 2006



The shift-share analysis also ranks industries in terms of their growth as indicated by the residence-based employment change over five years shown in Figure 6-7. (Charts for the localities are included in the Attachments without comment.) It is notable that in a context of overall growth, there can be

considerable variations either way in particular industries as they adapt to the changing operating environment.

The two periods provide a contrast with the period 1996 to 2001 showing growth in employment after a relatively low base in the early 1990s due to poor seasons and recession. The growth in employment was mostly non-agricultural and included mining, other manufacturing, building and construction, and the trade sectors. There were few negative changes in that period.

The situation in the 2001 to 2006 period was dominated by poor seasonal conditions that resulted in widespread losses in employment in agriculture and related activities such as wholesale trade. On the other hand, large gains were made in mining, meat processing, other manufacturing, retail trade, public administration, education and health. Those trends appear to have continued, and with a return to better seasonal conditions the region has high growth potential. That potential will be in agriculture-related activities, manufacturing and the growth in business services to support the rapid growth in businesses.

6.2.2 Agriculture

Agricultural production is a key factor in the performance of the Darling Downs region. Although the relative importance is diminishing, it is still important for some localities and for the value-adding industries that are related to agriculture. The value of production is indicated in Table 6-4 including some estimates for 2005-06 that may prove to be conservative. But they will be below what would be considered to be normal and are a factor that has slowed the Darling Downs economy in 2005-06. The severe effects of the drought were beginning to emerge by mid 2006 and in the successive years resulted in levels of agricultural production below that of 2005-06.

Table 6-4: Gross Value of Agricultural Production, Darling Downs

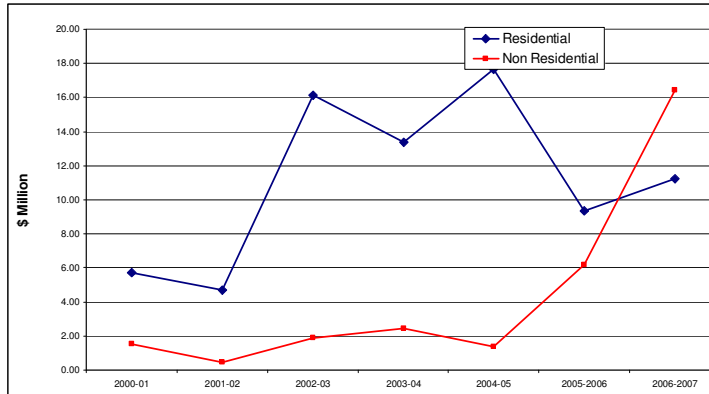
Darling Downs Commodity	1996-97 \$m	2000-01 \$m	2005-06 \$m
Grains	150	72	79
Cotton	127	83	114
Cattle	65	110	120
Pigs	10	25	45
Poultry	6	24	27
Other	48	57	
Total	406	371	385

Note: 2005-06 estimates by CARE and subject to revision.

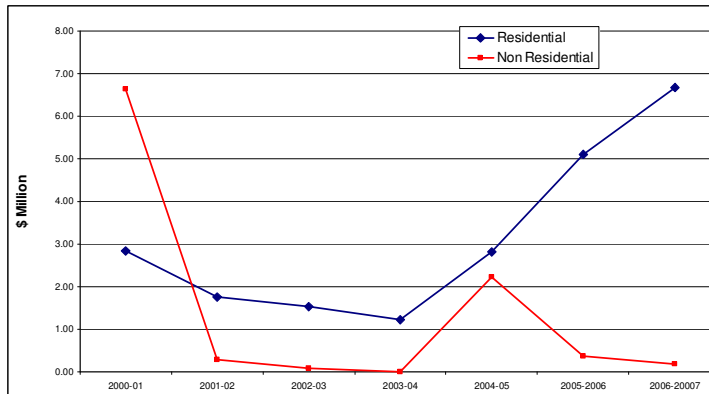
6.2.3 Building

Residential construction is an indicator of population growth while non-residential construction is an indicator of the overall level of business investment see Figure 6-8. Residential building is low but relatively stable between 1990 to 2003. Since then building has been negligible under the influence of continuing drought conditions.

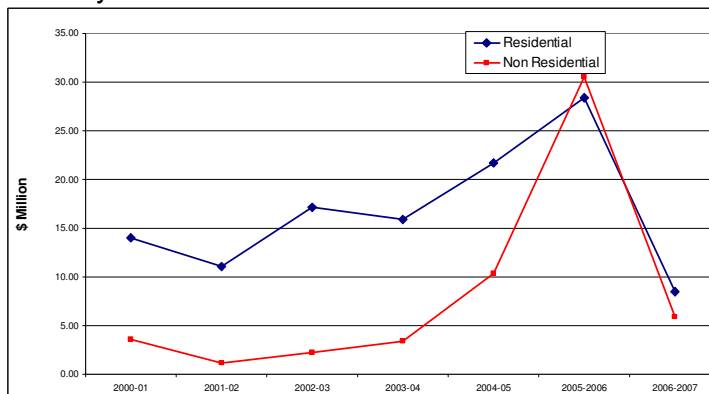
Figure 6-8: Building Approvals Darling Downs
Dalby



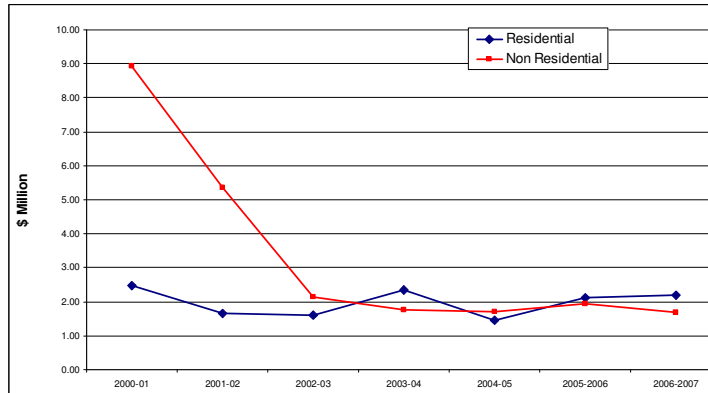
Wambo



Jondaryan



Millmerran



All of the regions with the exception of Millmerran have experienced a rapid rise in residential building in the 2000s that reflects the rising population in those areas. Non-residential building is more variable but tending upward in the main centre of Dalby. In addition to the building activities noted here, there will be substantial construction activities associate with major development, energy and mining projects.

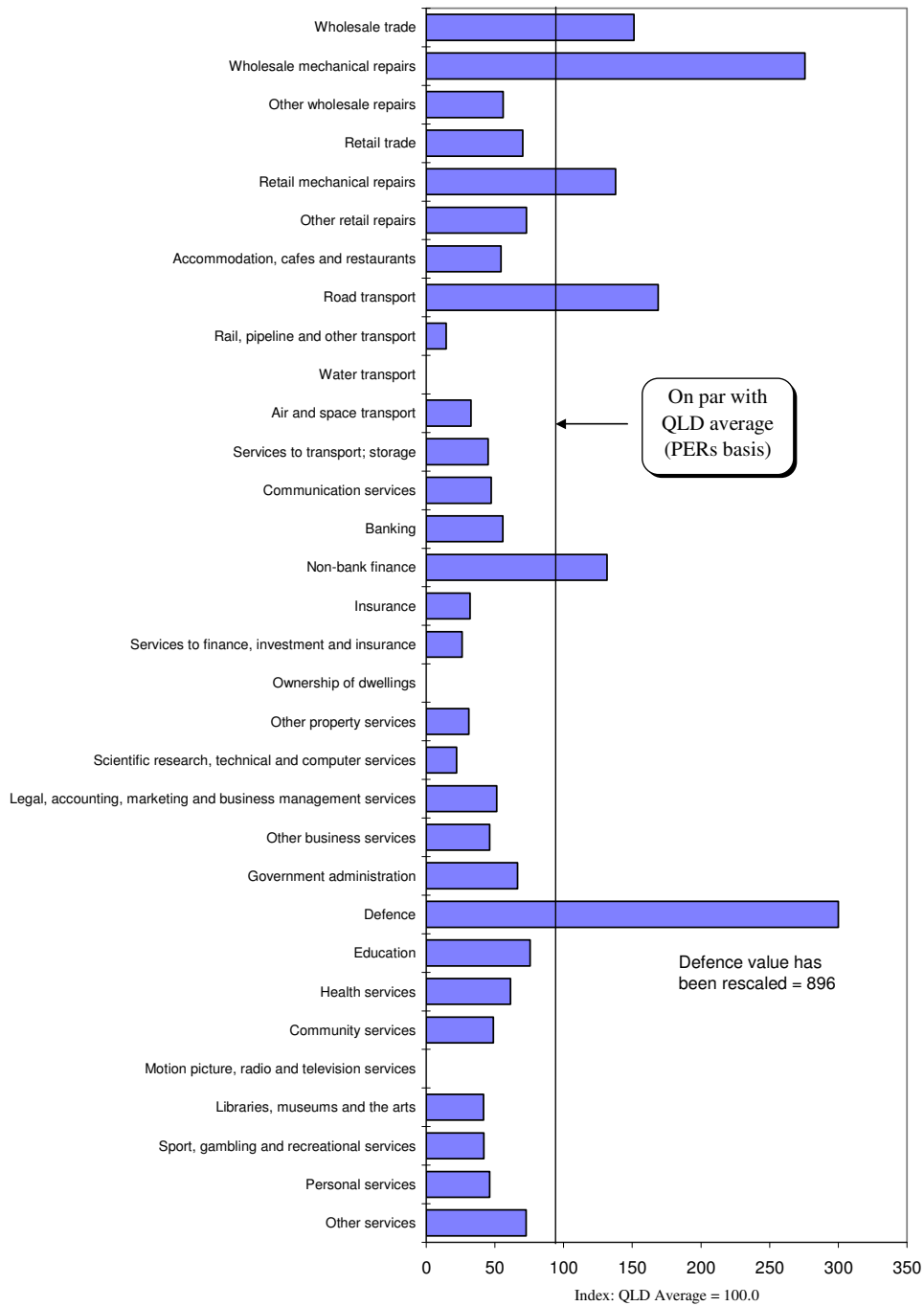
6.2.4 Service Delivery Levels

A benchmarking process for measuring the level of services in a region is to calculate for each industry the ratio between the population and the number employed in the particular service industry (know as a Population Employment Ratio – PER). For the Darling Downs, this is shown in Figure 6-9 for each of the main service industries as a ratio of the average level for Queensland. A value of 100 indicates parity with the Queensland average. (Figures for the localities are included in the Attachments without comment.)

This area has a substantial defence establishment that dominates the service delivery level. Otherwise there is a more even spread across all of the services than is normally the case for rural areas. This reflects both the larger region used here and the diversity of that economy as one unit.

There are notable strengths in wholesale trade, road transport, various kinds of repairs and non-bank finance. Many of these had their roots in servicing the needs of agriculture but it is likely that they now also service other markets. The level for retail trade, education, health and community care are all below the Queensland average. That is surprising given the size of the region. However, most of the region has ready access to Toowoomba which is a major urban centre and seems likely to be the pre-eminent supplier of these services to the Darling Downs region. Business services tend to have a higher level of supply relative to other cotton regions, but they still fall well short of the level for Queensland.

Figure 6-9: Service Delivery Index, 2006 Darling Downs



6.3 COTTON AND THE DARLING DOWNS ECONOMY

The Darling Downs economy is represented in the form of an input-output table. The table is a preliminary one as the ABS data on the gross value of agricultural production are not yet available. It provides a structure that can

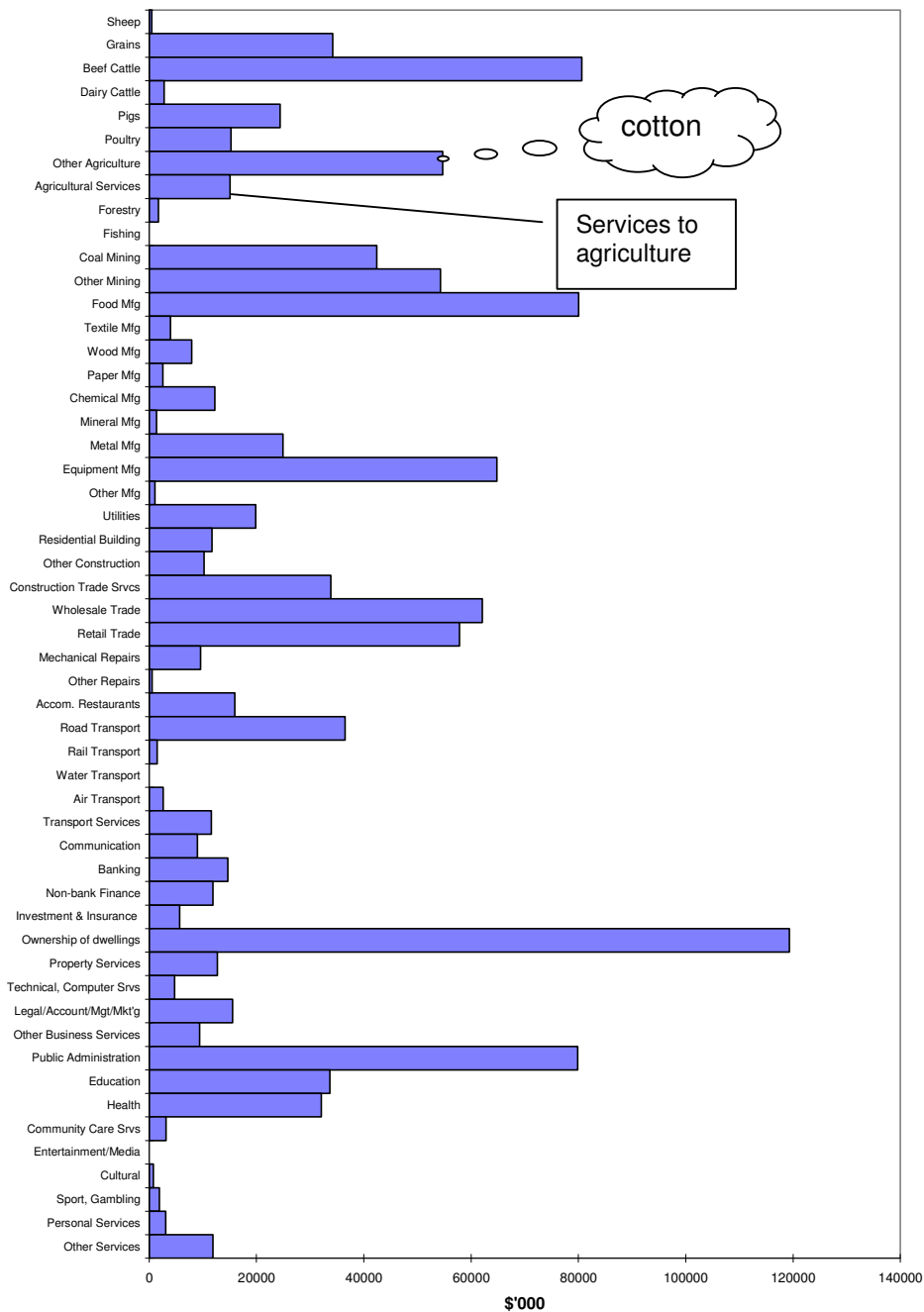
be used to compare economies over time in a consistent way. It is also used to derive multipliers that estimate the flow-on impacts associated with the cotton industry.

There are a number of ways to present some summaries of the information derived from the input-output table. In this case, a chart showing the industry contributions to GRP is shown in Figure 6-10. This is an aggregated version of information that includes 109 industries.

The features shown by this figure include:

- The importance of the agricultural industries is apparent, even in a period when the value of agricultural production has been depressed because of drought.
- The cotton industry and services to agriculture are important contributors even though they are dwarfed by cattle production in this case. The two industries make a contrast with the cotton industry operating with high input purchases and so having strong backward linkages to other sectors. The beef industry is less intensive apart from the feedlots, but generates high forward linkages to meat processing and marketing.
- Services to agriculture is also an important industry that is closely linked to cotton as it includes a range of crop husbandry operations, contract harvesting and cotton ginning. Many of these activities are reduced with smaller cotton crops such as during droughts.
- Road transport is an important industry in regional areas.
- The rental value and imputed value of owner-operated housing is one of the largest contributors to GRP. Inclusion of these values is conventional and helps to show the real value of the economic activities to residents.
- The other key industries are those relating to trade. Wholesale trade is significant as it handles much of the agricultural production. The wholesalers tend to have variable employment depending on the level of agricultural production.
- Those sectors with substantial public funding, public administration, education and health are also important. Community care is surprisingly small.
- Utilities also play a significant role, but are increasing as the region develops further electricity generators.

Figure 6-10: Industry Composition of the Darling Downs Economy



6.4 THE ECONOMIC IMPACTS OF THE COTTON INDUSTRY

The analysis is mostly focused on cotton growing. There is only a small amount (\$0.483m) of cotton industry research identified with Dalby and Millmerran and used for this analysis. There was \$2.6m of research allocated

to Toowoomba which would capture most of that expenditure but some of the on-ground work may have been undertaken in the Darling Downs Cotton region – that amount is unknown. The input-output model is used to calculate multipliers to estimate the flow-on effects. The multipliers are shown in the Attachments to this section.

6.4.1 Cotton Growing

A summary of the impacts for cotton growing is provided in Table 6-5. These show the flow-on and total impact of cotton growing that had a gross output of \$114m. Directly, cotton growing generated value added of \$29m, employment of 243 people who received income from that employment of almost \$9m.

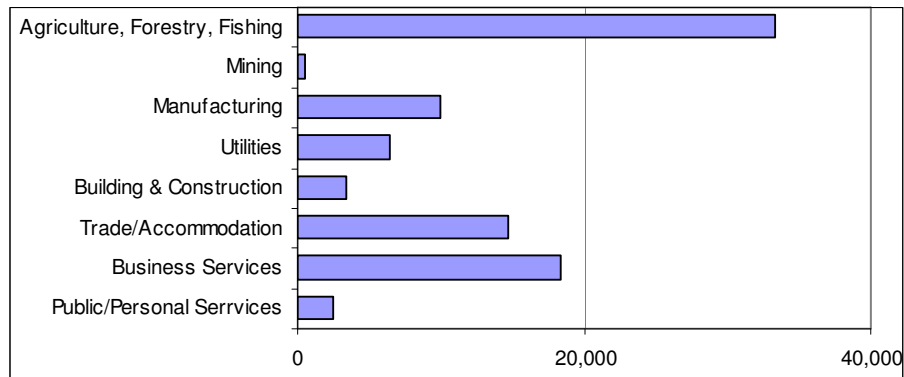
Table 6-5: Darling Downs, Cotton Growing Impacts

DARLING DOWNS COTTON GROWING IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	113,995	71,509	17,528	89,037	203,032
Value-Added (\$'000)	29,194	33,645	10,117	43,763	72,957
Household Income (\$'000)	8711	16214	4507	20722	29433
Employment (no.)	243	325	115	440	683

The total impact resulted in estimates of value added of \$73m, 683 jobs earning \$29m for their households. The large flow-on effects is concentrated in the production category and is a reflection of the large amount of services that are purchased by growers from other specialists. This includes cotton ginning, consultants and contracted farm operations such as spraying. Relatively few impacts accrue from the purchase of materials as most of those are imported with local distribution margins accruing locally.

The distribution of the flow-on impacts by broad industry groups is shown in Figure 6-11 (further industry details are included in an Attachment). This highlights the heavy concentration on the agriculture services activities and the use of a range of business and trade services. In the Darling Downs, there are notable flow-ons to manufacturing from within the cotton industry itself. The latter is a reflection of the capacity of local manufactures in the fabrication of machinery and structures and in undertaking machinery and other repairs.

The situation for consumer expenditure is similar to that for other regions in that most consumer goods are imported while the local expenditures are mainly on services.

Figure 6-11: Distribution of Flow-on Effects by Broad Sector (\$'000)

Relative to the Darling Downs region, the total impact of cotton growing amounts to

- 7.6 per cent of gross output,
- 5.7 per cent of value added,
- 4.5 per cent of employment, and
- 4.7 per cent of household income from employment.

These shares are relatively small compared to some of the other case study regions. However, the Darling Downs is the most diversified of the case study regions and with a growing economy based on non-agricultural industries that will lessen the dependence on agricultural industries.

6.4.2 Cotton Research

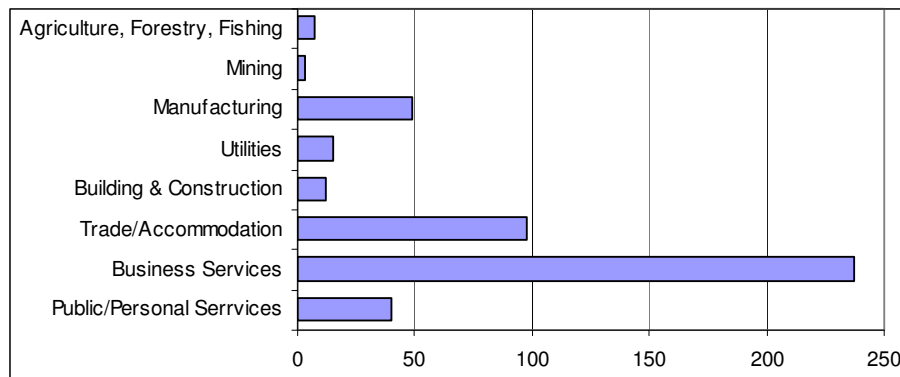
The cotton research impacts are shown in Table 6-6. These are relatively small impacts with the direct effect being less than \$0.5m. With both direct and indirect impacts, the total contribution to value added is \$0.5m with 7 people employed who earned \$0.36m in household income from employment. These values represent only a small fraction of one per cent of the total regional economy.

Table 6-6: Darling Downs, Cotton Research Impacts

DARLING DOWNS COTTON RESEARCH IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	483	246	216	462	945
Value-Added (\$'000)	236	117	125	242	478
Household Income (\$'000)	227	80	56	135	363
Employment (no.)	4	2	1	3	7

The multipliers for cotton research are shown in the Attachments along with some details of the distribution of the flow-on impacts. A summary of the distribution of those impacts are shown in Figure 6-12. The impacts are concentrated in the business services and trade and accommodation sectors of the regional economy.

Figure 6-12: Distribution of Cotton Research Flow-on Effects by Broad Sector (\$'000)



6.5 SUMMARY

Cotton growing is widespread over the Darling Downs region. There is a concentration in the area around Dalby along the Condamine River based on both river flows and the harvesting of overland flows. The area has had high agricultural potential based on the high quality land resources and the level and distribution of rainfall. It is these resources that underpinned the early development of the region.

The region used for the analysis included the LGAs (prior to amalgamation) of Dalby, Wambo, Jondaryan and Millmerran. These span most of the cotton growing area and the cotton growing activities are primarily supported from Dalby and to a lesser extent from Toowoomba. The population and employment has been growing in the region overall but some of the mainly rural areas have had declines. The growth has been concentrated in the urban areas, particularly Dalby and Jondaryan and parts of Millmerran. This has been led initially with industries associate with agriculture, (machinery and equipment, product handling, storage and marketing, and meat processing) and more recently with new energy developments (coal mining and power station near Millmerran, coal seam gas developments), and the defence base and aircraft manufacturing.

This region has significant diversity of industry and a selection of growth industries that result in a robust and growing economy. That has impacted particularly on Dalby with a population profile similar to that of Queensland while the other areas have a profile more typical of inland regions with an

ageing population and with relative shortages of population in the 20 to 40 years age groups.

The cotton industry competes for natural resources against a variety of other cereal, oilseed and horticultural crops. In 2005-06, the cotton crop was around average. In total, the industry contributed around 5 per cent to the Darling Downs region as defined. In value terms it was around \$73m to GRP, up to 700 people employed and nearly \$30m to household income from that employment. Cotton research is a small component of the contribution of the cotton industry to the region at a fraction of one per cent.

The Darling Downs region has many developing strengths that provide a range of business opportunities. It is the least remote of the case study regions so that it is able to capitalise on its proximity to the rapidly-growing south-east of Queensland. At the same time, that proximity leads to some important leakages of expenditure from the region to Toowoomba and curtails the development of some services that may be locally provided.

The Darling Downs region is also the largest of the case study regions in terms of population and economic activity. The urban centres of Dalby and Jondaryan dominate. There is still a substantial rural component of the region where primary industry is dominant and the commonly observed trends in the economy prevail. Even so, those areas appear to be within commuting distance of major centres providing access to some of the benefits of urban growth for those rural residents.

ATTACHMENTS

Cotton Growing Multipliers

DARLING DOWNS COTTON GROWING MULTIPLIERS	Direct Effect	Flow-on Effects			TOTAL IMPACT	Type II
		Production Induced	Consumption Induced	Total Flow-on		
Gross Output (\$)	1.000	0.627	0.154	0.781	1.781	1.781
Value-Added (\$)	0.256	0.295	0.089	0.384	0.640	2.499
Household Income (\$)	0.076	0.142	0.040	0.182	0.258	3.379
Employment (no./\$m)	2.1	2.9	1.0	3.9	6.0	2.812

Cotton Research Multipliers

DARLING DOWNS COTTON RESEARCH IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
Gross Output (\$'000)	483	246	216	462	945
Value-Added (\$'000)	236	117	125	242	478
Household Income (\$'000)	227	80	56	135	363
Employment (no.)	4	2	1	3	7

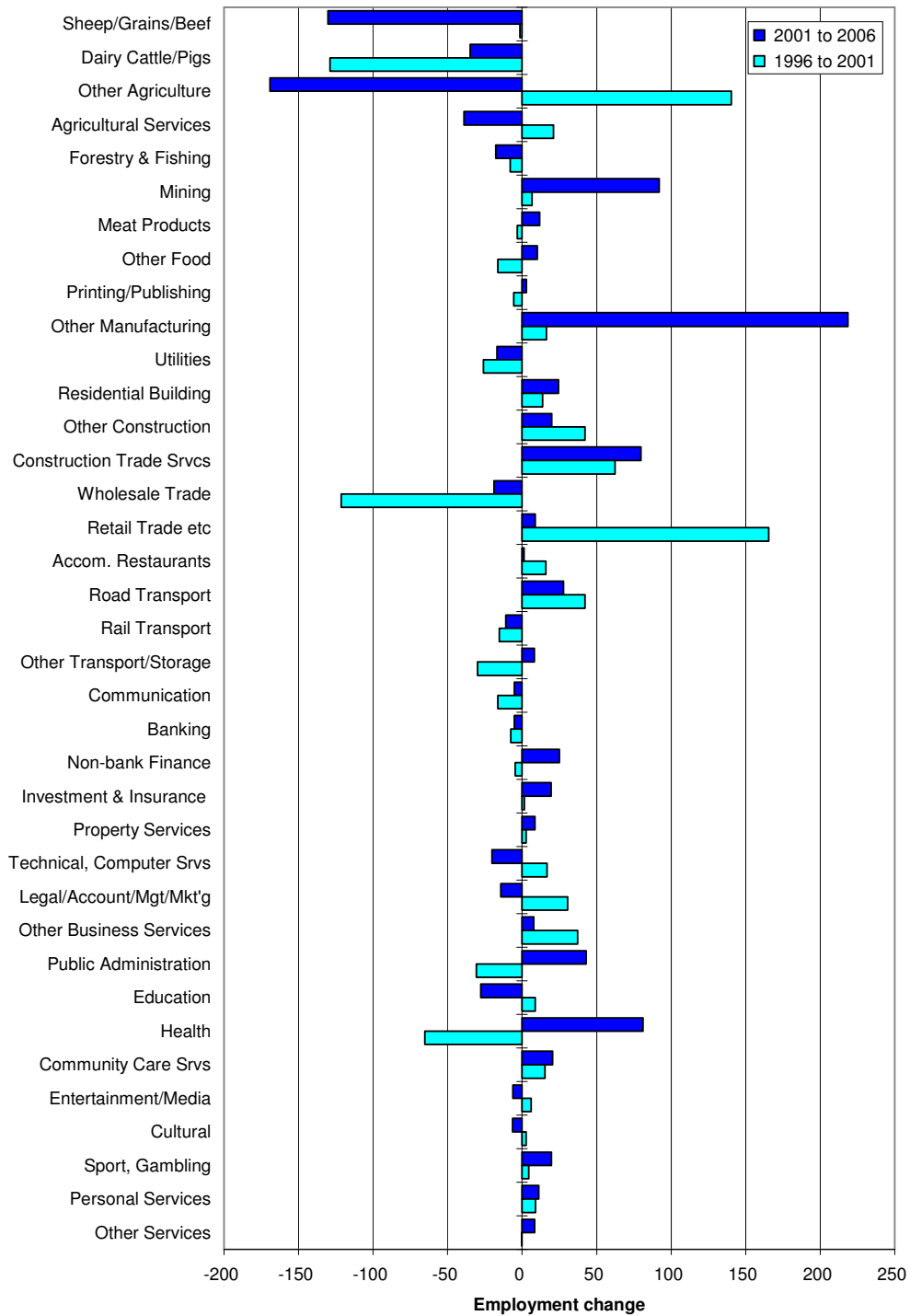
Impact Distribution Ranked by Industry: Darling Downs Cotton Growing

Darling Downs Cotton Growing: Output Flow-on Impacts Sector	Ranked Flow-on	
	\$'000	%
Services to agriculture; hunting and trapping	29,917	33.6
Wholesale trade	8,317	9.3
Road transport	5,702	6.4
Water supply; sewerage and drainage services	5,202	5.8
Ownership of dwellings	4,233	4.8
Retail trade	3,308	3.7
Other agriculture	2,893	3.2
Basic chemicals	2,685	3.0
Legal, accounting, marketing and business management services	1,913	2.1
Other construction	1,798	2.0
Agricultural, mining, lifting, handling and construction machinery	1,547	1.7
Accommodation, cafes and restaurants	1,398	1.6
Banking	1,376	1.5
Construction trade services	1,287	1.4
Other property services	1,179	1.3
Retail mechanical repairs	1,140	1.3
Electricity supply	1,032	1.2
Non-bank finance	925	1.0
Other food products	834	0.9
Services to transport; storage	781	0.9

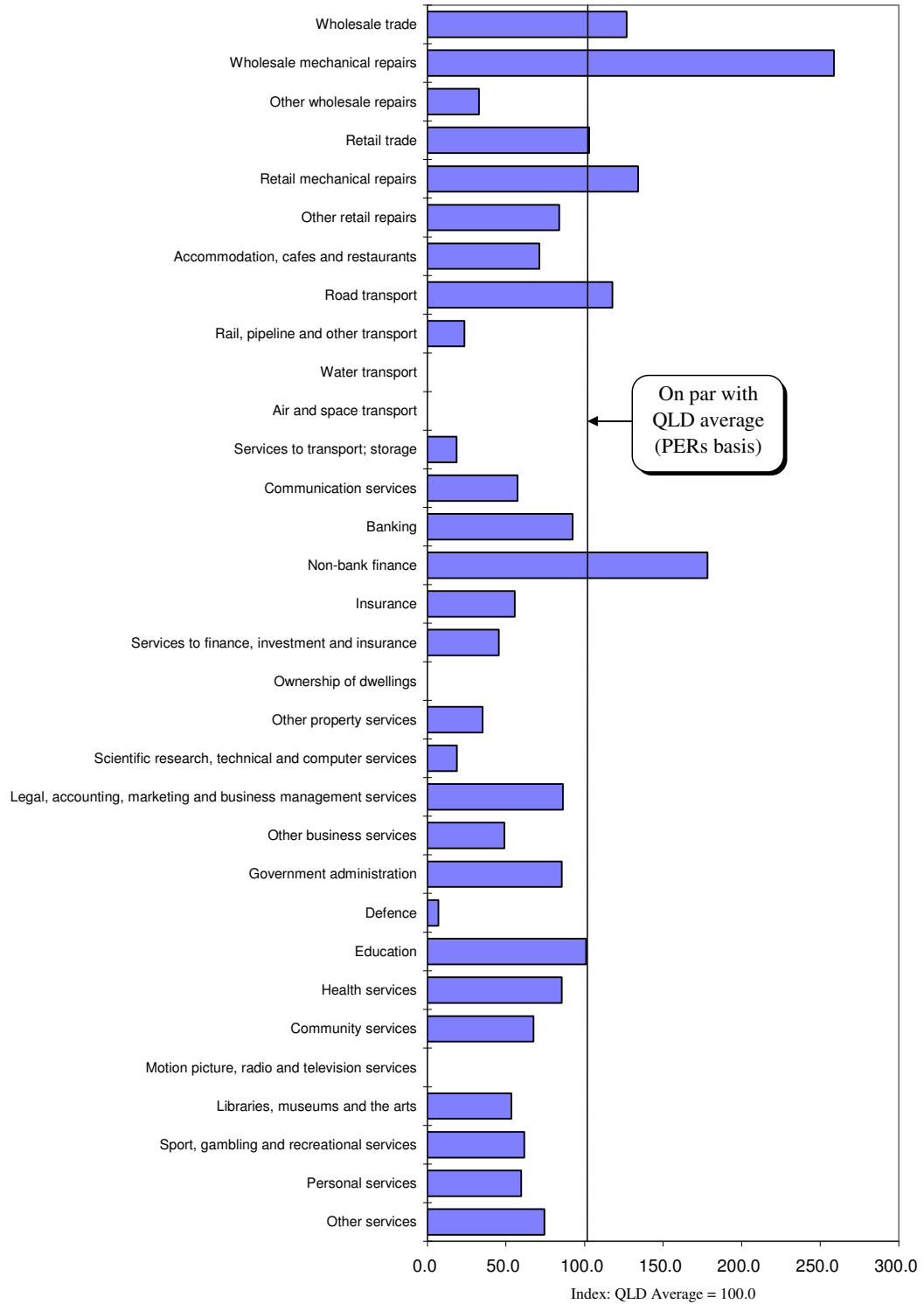
Impact Distribution Ranked by Industry: Darling Downs Cotton Research

Darling Downs Cotton Growing: Output Flow-on Impacts Sector	Ranked Flow-on	
	\$'000	%
Ownership of dwellings	52	11.3
Legal, accounting, marketing and business management services	48	10.3
Scientific research, technical and computer services	36	7.8
Wholesale trade	31	6.8
Retail trade	31	6.6
Other business services	28	6.2
Accommodation, cafes and restaurants	18	4.0
Communication services	13	2.9
Education	13	2.7
Other property services	12	2.7
Banking	12	2.6
Retail mechanical repairs	9	2.0
Services to transport; storage	9	2.0
Electricity supply	9	2.0
Road transport	9	1.9
Construction trade services	8	1.6
Government administration	7	1.5
Non-bank finance	7	1.5
Other wholesale repairs	7	1.4
Health services	6	1.4

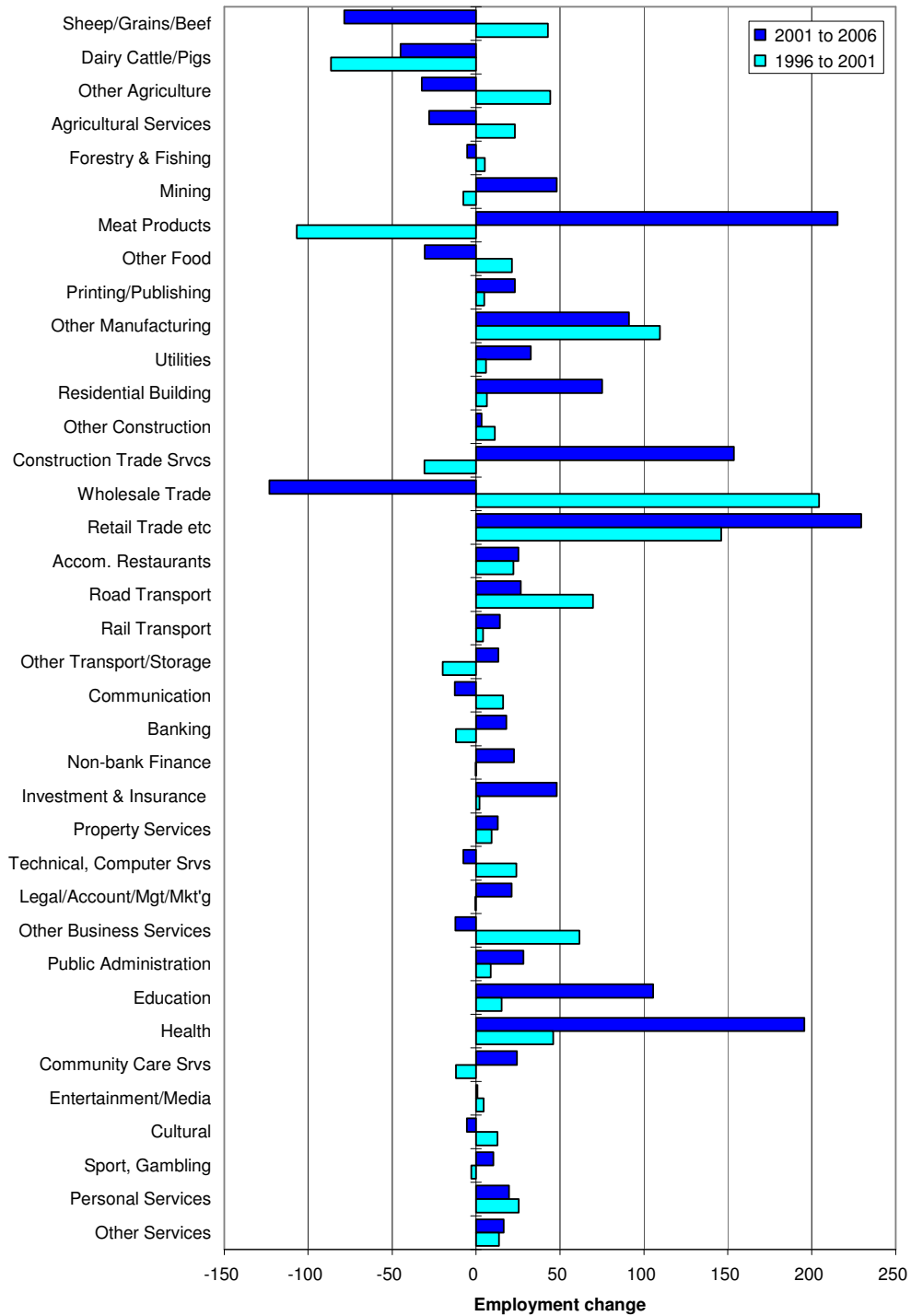
Employment Change by Industry 1996 to 2006: Dalby-Wambo



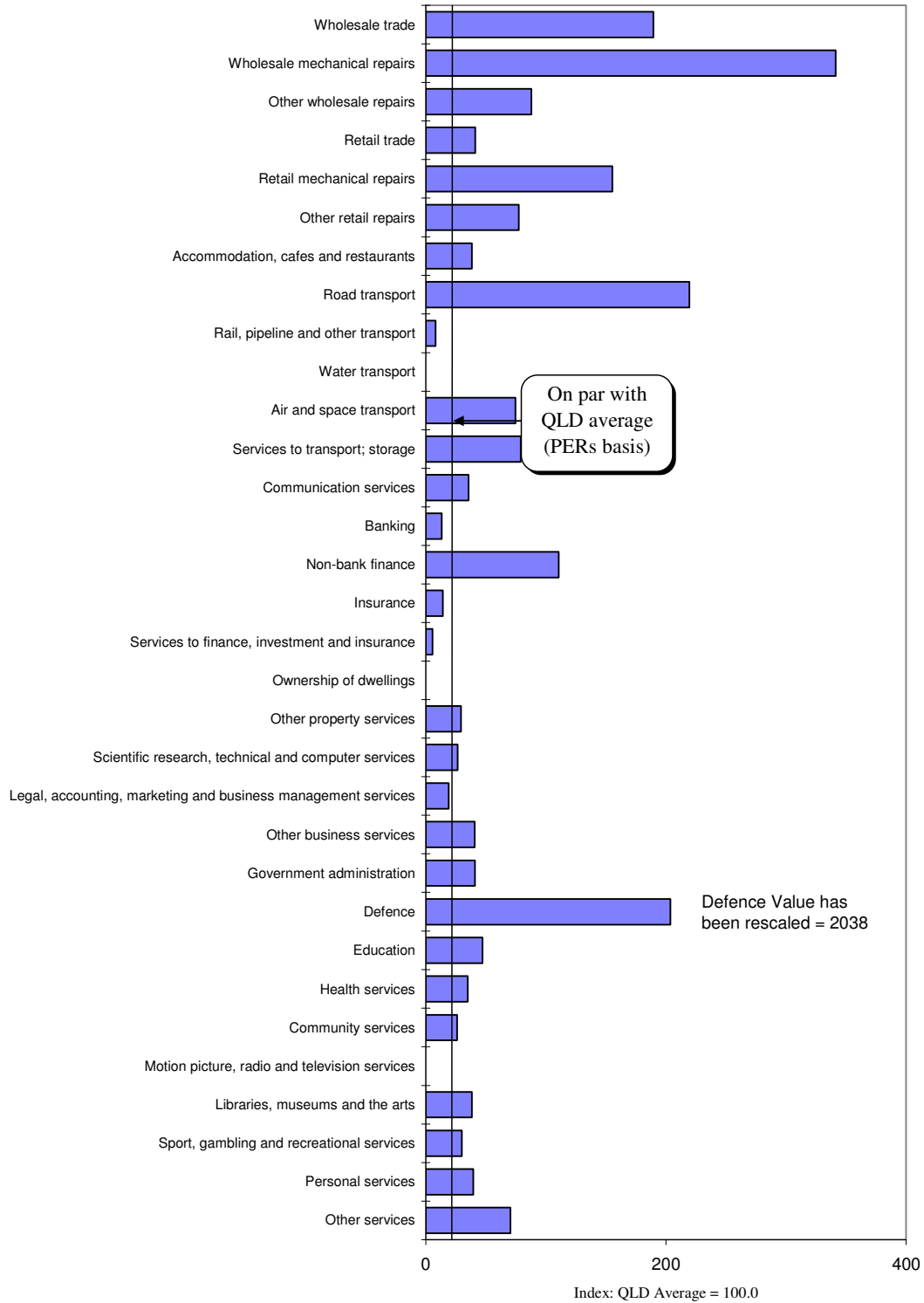
Service Delivery Index 2006: Dalby Wambo



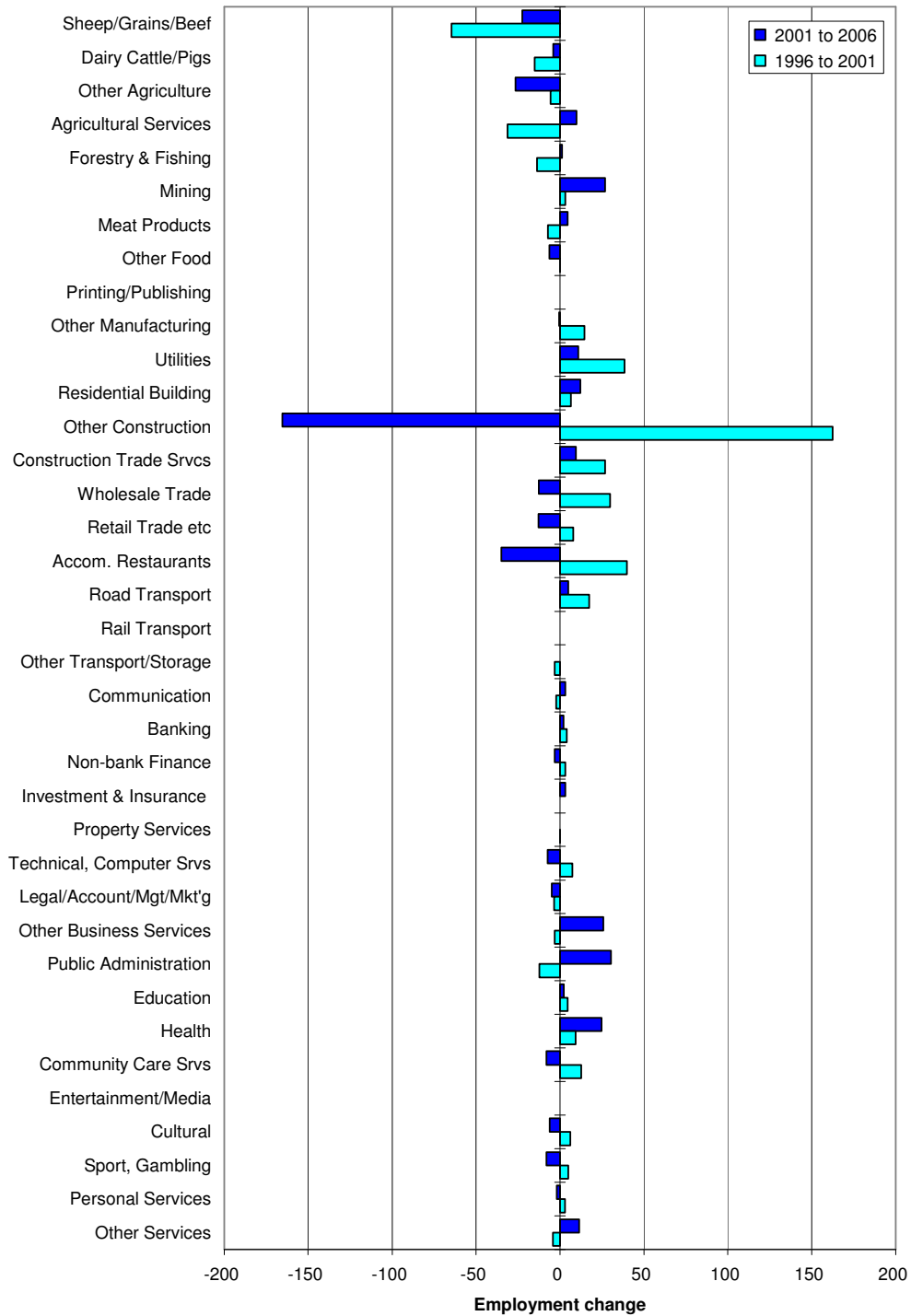
Employment Change by Industry 1996 to 2006: Jondaryan



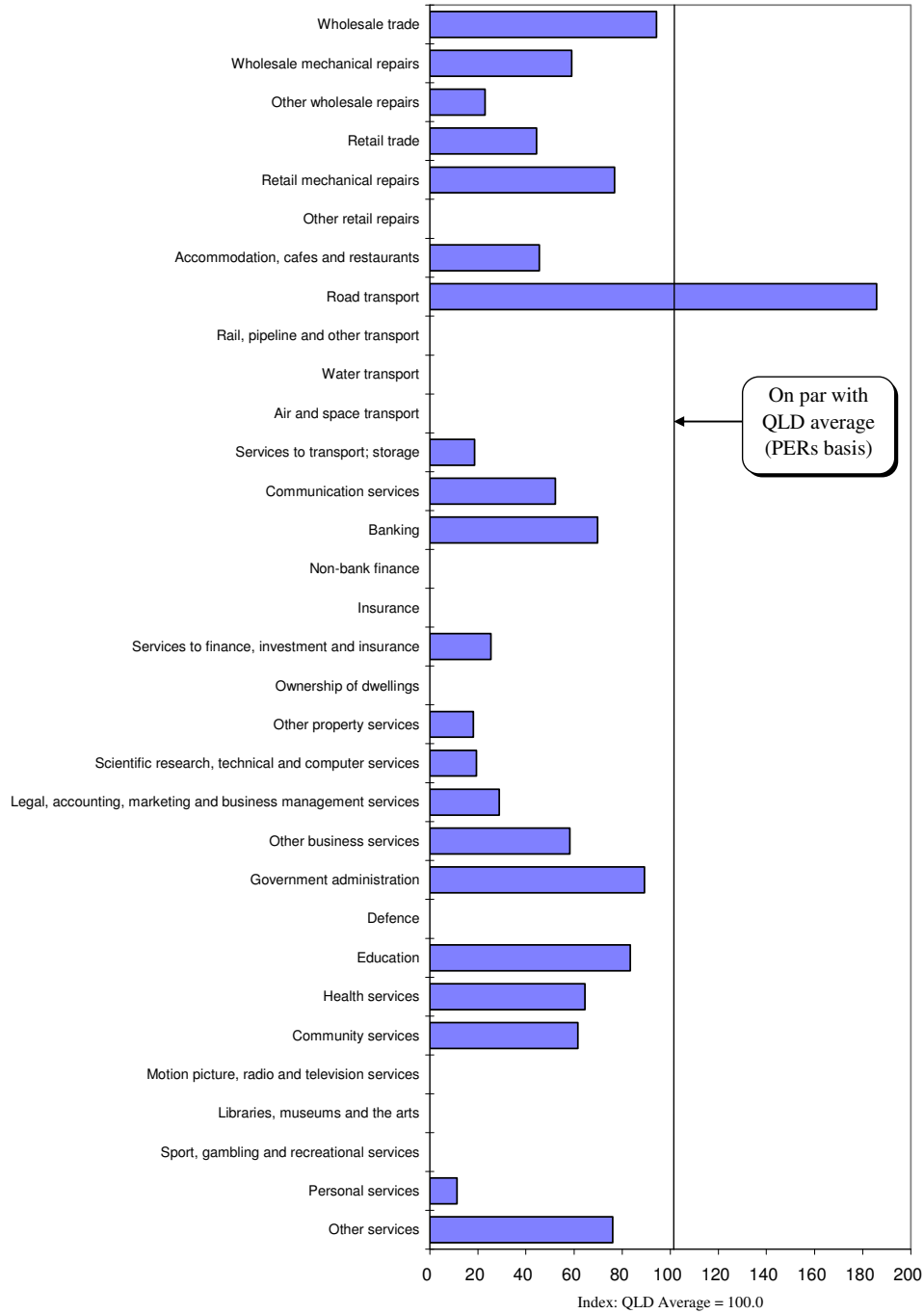
Service Delivery Index 2006: Jondaryan



Employment Change by Industry 1996 to 2006: Millmerran



Service Delivery Index 2006: Millmerran



7. SUMMARY AND CONCLUSIONS

7.1 THE BRIEF

The purpose of this research has been to compile and interpret a benchmark set of socio-economic data for a number of case study cotton catchment communities. The communities studied are all regions where there is significant production of cotton along with associated support industries. Not all cotton communities are included in the study, but it includes communities with a range of situations, economic structures and development opportunities.

The nominated regions were as follows

- Narrabri
- Moree
- Narromine
- Warren
- Dalby and Cecil Plains.

The Queensland region was interpreted as being those cotton areas around Dalby and included the areas in Wambo, Millmerran and Jondaryan LGAs (prior to amalgamation). The areas in NSW were interpreted as the LGAs that are so named.

The benchmark data that are the focus of this report are those on the economy. Appropriate and good quality data on regional economies are limited and often not particularly timely. For this study, 2005-06 was selected as the year for analysis as that was close to a number of censuses. Even so, some of the critical data for regional areas such as the gross value of agricultural production at the small region level were not available for 2005-06.

To compile a set of suitable data on a regional economy, a reference point was found in those data that is used to describe the national economy. These data form what are known as the 'national accounts' and those key measures have been estimated for the cotton catchment case study areas. This is not an easy task for people without skills and experience in the area. However, they are the most important data to have even if it is likely that various agencies in the regions would not be able to compile them without outside help.

These data are in essence a 'snapshot' of the economy at a particular point of time. They can be used to:

- Inform agencies and others about the current situation;

- Identify and estimate the contribution that the cotton industry makes to the existing economy;
- Provide a base for planning how to build further value from the existence of the cotton industry (and other industries);
- Provide a basis for determining economic development strategies for the region;
- Provide information to assist in planning economic development projects; and
- Provide a baseline against which the region can be compared with other regions and at future times to make some assessments of performance.

These are ambitious tasks. However, those tasks can be carried out more effectively with these data than they would be without the data. The differences that have been revealed among the regions highlight the need to tailor strategies and plans to the local requirements as indicated by these data. There is some discussion of these implications in the chapter on each of the regions.

7.2 THE TASKS

The work has involved a number of tasks.

- The compilation of data from a number of sources including the population census, agricultural census, building statistics, employment data and income data.
- Analysing those data to build appropriate measures of characteristics of the region economy.
- The construction of an input-output table for each of the regions as part of the description of the region economy and as a model that can be used for impact analysis.
- Visits to each of the regions to discuss the findings of the desk-top research to confirm the findings and interpretation and to uncover additional data and information that would assist in the completion of the tasks.
- An assessment of the contribution of the cotton industry to the region economy taking account of the various components of the cotton industry and both the direct and flow-on impacts. The impacts included are all of the supply-chain activities up to the marketing and handling of the cotton. Estimates are also made of the impacts from the research and development activities that are operated under the Cotton Catchment Communities CRC and the Cotton Research and Development Corporation that occur in the nominated case study regions.

In addition to this report, there is a considerable amount of supplementary information about each of the regions on a CD. This includes:

1. The base data and analysis of the employment data in two forms, namely the resident basis and the workplace basis. The same analysis has been undertaken for each of the five case study regions. This is in spreadsheet format with many sheets of data and charts, a selection of which is included in this report.
2. The input-output tables, also in spreadsheet format and for each of the five case study regions. This also includes both data and charts from the data used to compile the input-output tables.

Assistance with these supplementary data resources, their use and interpretation in addition to that included in this report is available directly from CARE.

A final step will be to revisit the regions to provide an overview of the findings and to assist in their use by various agencies in the region.

7.3 THE DATA FUTURE

The data presented in this report are the result of two decades of development by CARE to provide a set of data and to use that data as the basis for building economic development strategies. The paucity of data is of great concern, and there are no signs of the situation improving. There are no reliable, off-the-shelf economic data available to use as an indicator of trends in regional economies. And for rural regions, the data on their key industry, agriculture, is compiled only every five years (see subsequent section on a possible solution to this issue). This is an unsatisfactory situation for planning purposes and is a factor in the poor outcomes from many economic development programs (see section below on economic development).

7.3.1 Existing Indicators

The main economic indicator that is regularly available for small areas are the quarterly labour market data from the Department of Education, Employment and Workplace Relations. These data are compiled from labour force surveys and the use of various modelling methods. The indicators are of the labour force and the number unemployed. Both are useful and bear a relationship to the level of economic activity in the region. There are two main concerns about these data:

- Because of the methods used to compile the data, there are relatively high sampling errors in the estimates that are relatively large in small regions. While 'smoothing' is used to reduce the significance of random and sampling errors, this may be inconsistent with these data being a readily available and reliable indicator of new trends in a region.

- There has been a rapid evolution of labour markets over past decades which can be generally described as 'increasing flexibility'. This means an array of employment conditions and arrangements in the workplace with more working part-time, job sharing, flexible hours and so on. The substantial number of self-employed – a notable characteristic of rural regions – also provides for potentially large variations in the amount of labour actually provided to the business. In days of contraction, some employers will prefer to keep staff but on reduced hours rather than retrench workers. Because of these developments, it is unlikely that these employment data would be reliable indicators of how the regional economy is performing.

If the objective is to provide on-going and timely information on local economic conditions, then most of the required data will need to be collected from local sources. Because this is a costly task, the data collected need to be carefully selected, related to the characteristics of the local region economy and aligned with key development strategies to indicate progress on those strategies. Some examples of indicators that might be relevant include:

- A sample of retailers providing monthly sales data may be an indicator of household income and wealth.
- The use of monthly building approvals data (but that will not always reflect actual construction).
- Sales of motor vehicles may be indicative of expenditure on consumer durables.
- Passengers through an airport might be an indicator of the overall health of the economy (although discounting fares can distort the real trends).
- Information on business formation and closure can be indicative of trends in business conditions.

For a number of regions, including the cotton case study regions, their performance is closely related to the value of the exports they make to the rest of the country and to overseas. Information on commodity prices is readily available and so does provide some guidance to the performance of the regional economy, subject to production levels and quality differences. The possibilities relating to developing timely data on agriculture is considered next.

7.3.2 Measuring Agriculture

In all of the cotton communities, agriculture in total and cotton in particular represents a significant part of the regional economy, ranging from very high in Warren and Moree and lower in Darling Downs (although it is large in some of the local areas such as Millmerran). It is conventional wisdom that agriculture is an industry with large annual fluctuations in the volume and value of production. That variation has a significant impact on the whole region economy and its businesses. Yet there is no systematic, regular

production of estimates of agricultural production and the value of agricultural production for local areas now that the ABS has reverted to 5-yearly censuses.

In addition to the existence of agricultural data at the local level, there is the timeliness of the information to make it useful in business management and planning. The lags in the publication of official statistics mean that the information is of limited value for business planning.

For planning purposes, a number of agencies prepare specific production forecasts using a variety of methods and regional disaggregation. Some of the information is proprietary and is not available for general use. It is also likely that most businesses in rural regions operate without the need for periodic information about the performance of the main industry in their regional economy. There is no apparent demand for better information for management and planning purposes. However, that does not preclude the possibility that such information might assist many more business operators if it was generally available and they developed some capacity to use it in their business management.

Technological advances might be able to offer a possible way to overcome the challenges in conventional approaches to preparing timely estimates of agricultural production for local areas. Consideration was given to the use of GIS and satellite imagery methods as a way of developing estimates in an economical and timely way for small areas. The following outlines how it might be done. The question of whether an initiative in this direction would be worthwhile is not able to be answered at this time.

The basic approach is to use GIS and satellite imagery to provide an estimate of the area that is planted to a specific crop. These data can then be exported to a spreadsheet where commodity yield and value data can be entered to arrive at an estimate of the value of cropping for a particular Shire area.

Narrabri Shire has been used to develop this method and the data has been provided under license from Narrabri Shire Council to the consultant. In addition, the consultant has done a detailed land use survey of the Shire in conjunction with work for the Narrabri Shire Growth Management Strategy.

A Geographical Information System Computer program is needed as well as some GIS Layers. MapInfo is considered to be a suitable program and this has been used to develop this method. There are other GIS programs that could be used.

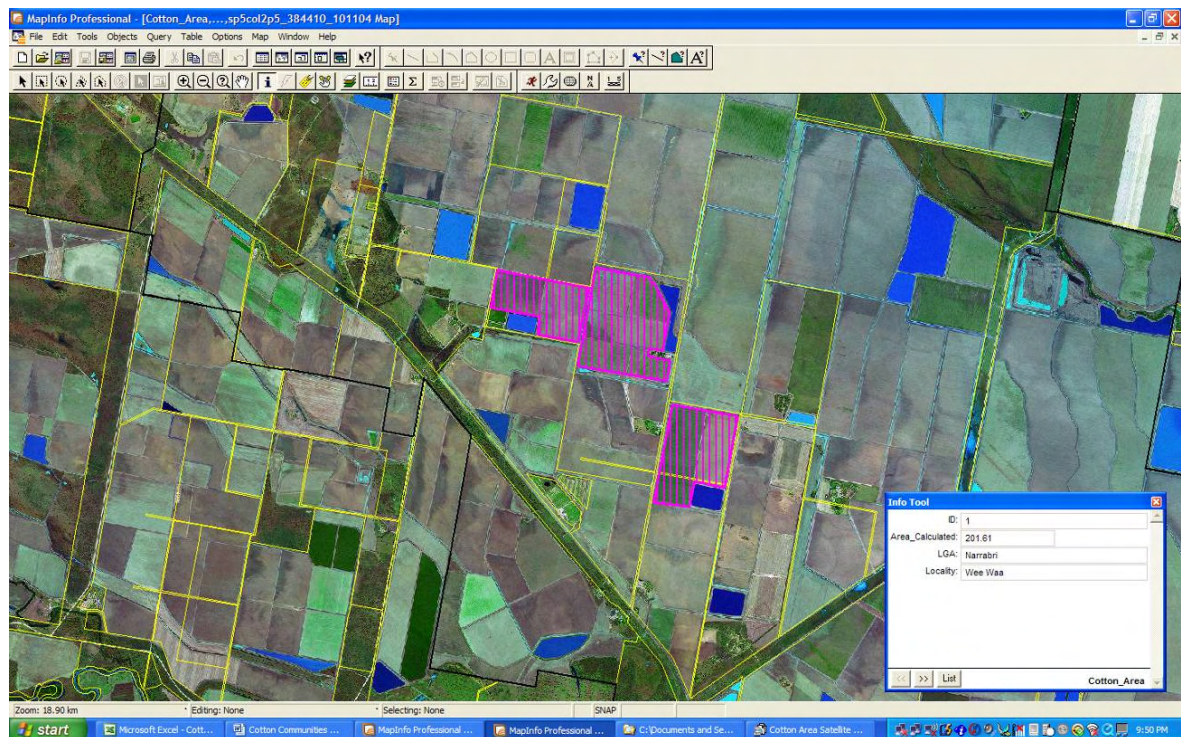
The GIS data layers include the following:

- Cadastre
- Unique Property Number
- Real Property Description
- Owner

- Street
- Locality
- Parcel Area
- Satellite Imagery – Spot Image

The following is based on making estimates for irrigated cotton but has the potential to be developed for other identified crops. All of the data except the imagery is combined into one Map file which is used to provide the base. The satellite imagery is then overlaid with this data. This will allow the irrigation farms to be identified. The land that is used for irrigated cropping is identified to provide a base which can then be used to highlight the area that is cropped at certain times of the year. This is best done by someone who has experience in satellite imagery interpretation.

Figure 7-1: Satellite Imagery and Irrigated Land



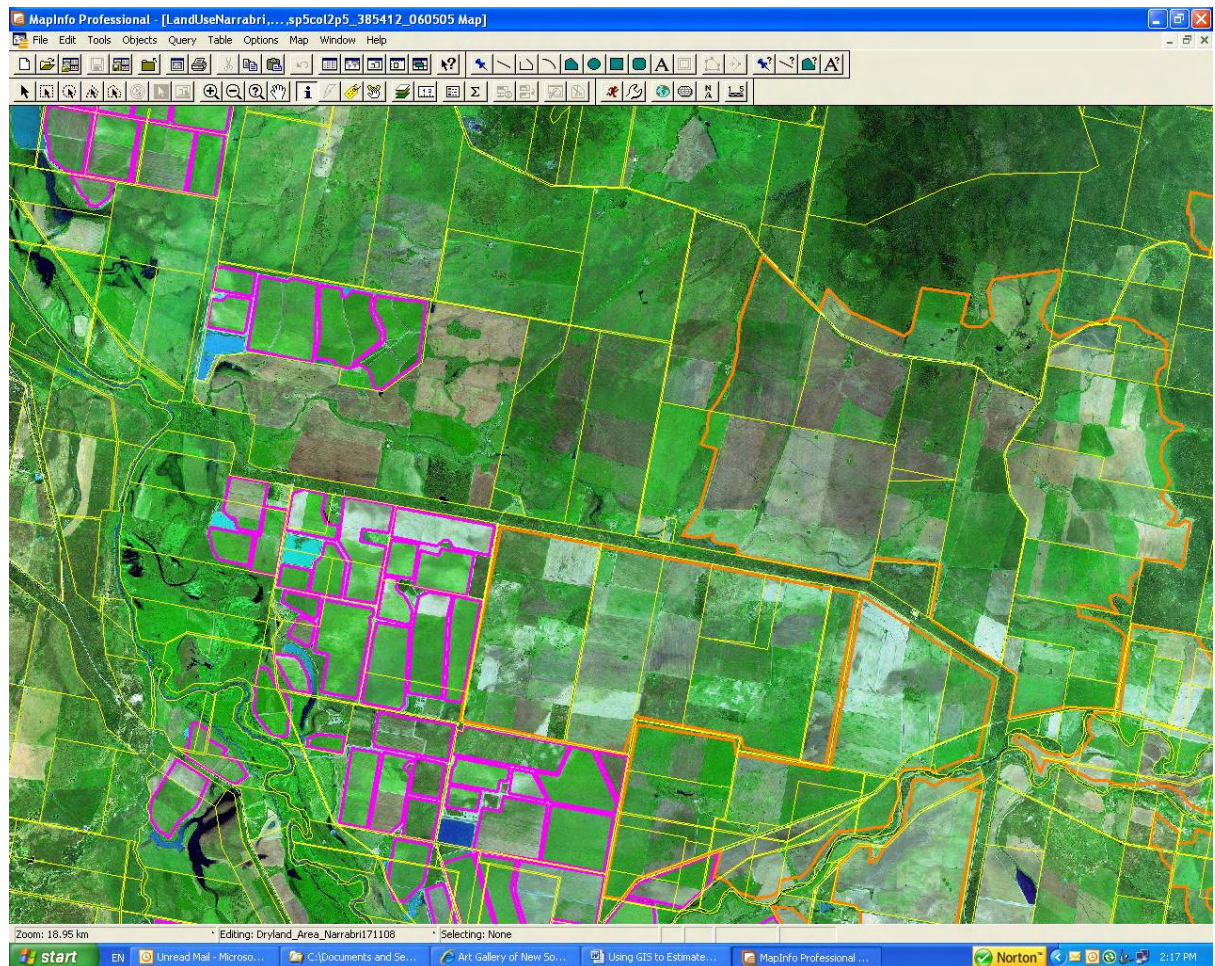
The irrigated land is identified by looking for the water reservoirs and irrigation channels. Once this has been done, the area planted can be identified by its green colour or brown if the land is not planted. A specific polygon can then be created for each contiguous area of planting and this is saved as a new layer in the GIS which is then populated by the creation of other polygons for the entire Shire. This can be seen from Figure 7-1 which shows the satellite image which has been overlaid with the cadastre (shown in yellow) and the irrigation area has been shown by the pink hatched areas which are the separately created polygons. The database is then set up to identify each farm by a number and the locality and Local Government Area are also added. The program can calculate the area that is planted. In this case, farm

1 has 201.61 ha of planted area. This can then be added to the database and used to calculate the total area of irrigated cropping that could be planted (or lesser areas depending on the amount of water that is available).

In this example cotton has been used but by using satellite imagery from specific times of the year, estimates for other plantings can be derived from the colour and row density of the image. For example cotton would be best identified in December and late-sown sorghum in February.

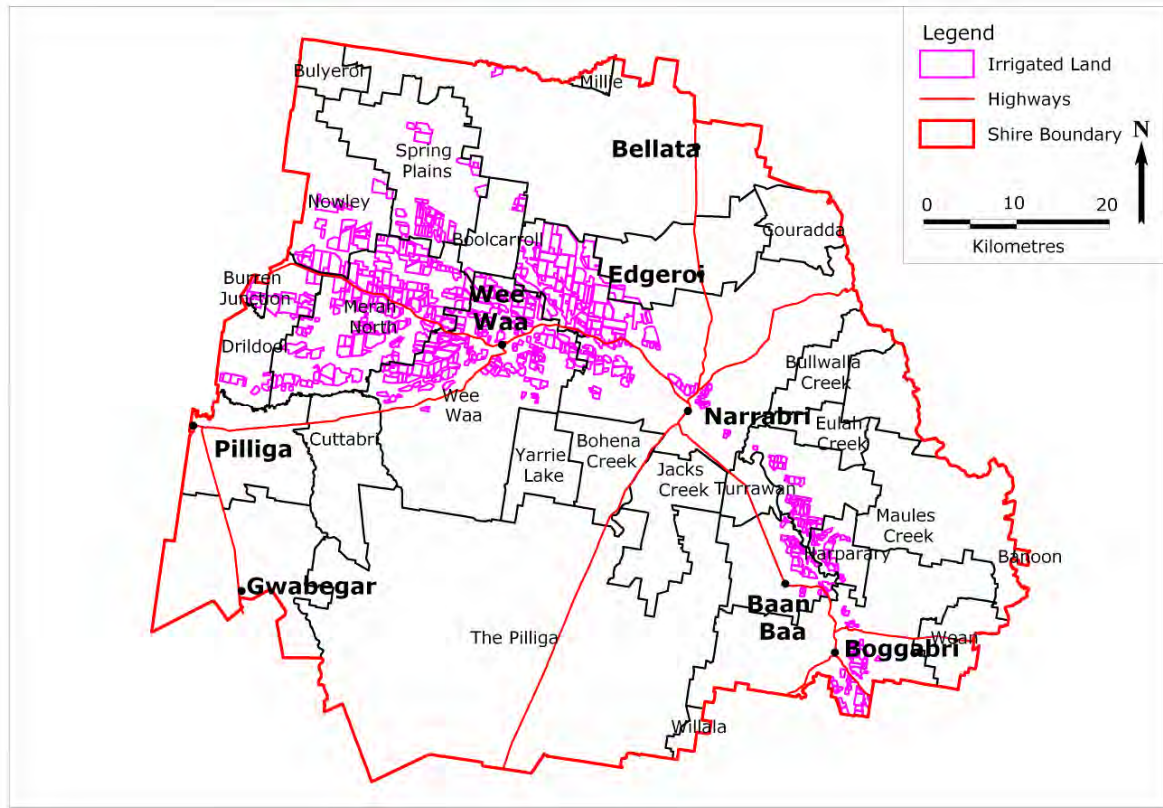
It is also possible to map the area that is used for dryland cropping by looking for the areas that are not irrigated (there are no reservoirs or irrigation channels) and are not used for pasture or native vegetation. This can be seen from Figure 7-2 which shows the irrigated area outlined in pink and the dryland area outlined in orange.

Figure 7-2: Satellite Imagery of Dryland and Irrigated Land



Once the whole shire has been done it is possible to generate a map of the irrigated areas for the whole shire. This is shown as Figure 7-3.

Figure 7-3: Irrigated Land in Narrabri Shire



The data should be discussed with the DPI extension officers and local agronomic consultants to verify its accuracy. It would also be possible to expand the database to take into account new areas being planted – both irrigated and dryland.

The data can be exported to a spreadsheet program. In this case, MS Excel has been used for a table such as that shown in Table 7-1.

Table 7-1: Irrigated Area Data

Irrigated Area ID	Irrigated Area (ha)	Local Government Area	Locality
1	406	Narrabri Shire	NARRABRI
2	202	Narrabri Shire	NARRABRI
3	380	Narrabri Shire	NARRABRI
4	617	Narrabri Shire	NARRABRI
5	533	Narrabri Shire	NARRABRI
6	135	Narrabri Shire	NARRABRI
7	74	Narrabri Shire	NARRABRI
8	873	Narrabri Shire	NARRABRI
8	391	Narrabri Shire	NARRABRI
10	176	Narrabri Shire	NARRABRI

The accuracy of any data set provides some room for error in the interpretation. However this data set is to provide a timely indication of the amount of land cropped for both irrigated and dryland crops. There may be an error in the vicinity of 10 – 20 per cent, and that may be considered acceptable having regard to the use of the final data and the time it would take to make it more accurate – this would involve ground truthing which would take a lot more time.

The above has the purpose of simply demonstrating what is possible. Making it practicable for local areas is problematical and may consume considerable resources. The options include building it into the work of Council planners who have GIS and related capacities, using a collaborative approach through say the CMA to gain economies of scale and build expertise or seek a commercial business that could do this work as a specialist service provider.

A Canberra-based company (Agrecon) has been developing these technologies over the past decade. Most of their focus is at the micro level where the technology becomes an integral part of the management of land, crops and moisture among a range of specialist services that are offered.

Agrecon has developed the methods to produce regular estimates of the value of agricultural production for local government areas. The estimates can be made while the crop is developing and on completion of harvest and so has a forecasting role as well as providing annual actual data making the information useful for a number of management needs. At this stage, this capacity has not been commercialised on a systematic basis but it could be with further development and the demonstration that there is a demand for the information,

The coverage is limited to broadacre operations and does not include horticulture and intensive livestock operations. That may not be a serious issue as these operations may not have large year to year variations in production. However, further development of the technology may be able to extend the coverage but it seems likely that there will always be some gaps from the use of satellite imagery alone. In a future where water is relatively less abundant and comes at a higher cost, then there will be an increased interest in crops producing high values per unit of water such as horticulture. Some further development in relation to horticulture may become more important as time passes.

Further investigation of the potential of satellite imagery to provide periodic and timely estimates of the value of agricultural production is being explored to fill this data gap. For this to be a low-cost source of information, the need of a substantial number of users would be required to justify the further development of the methods. It will also be necessary to define specifically the information that is required and the frequency of the estimates. Even so, this method appears to be the best possibility for filling an information gap that is important for rural regions, including those where cotton is an important crop.

Finally, an assessment would need to be made about the value of the information to prospective users, and especially in relation to the management of regional businesses. A pilot program could be undertaken in a suitable region along with consultations with businesses to provide a better indication of the likely costs and benefits of such information. A watching brief should be kept on the development of this family of technologies which are improving and should at some stage be able to fill this information gap at an acceptable cost and accuracy.

7.4 THE FINDINGS AND IMPLICATIONS

A summary of the findings from the analyses is shown in Table 7-2. This shows the scope of the case study regions studied and the relative significance of the cotton industry to those regions. In interpreting these results, the aggregated nature of the Darling Downs region should be noted. Further, in most regions, 2005-06 was a relatively poor season for grain production while cotton was relatively near to average. As a result, the share of cotton growing in those economies is higher than the proverbial “average”. Since 2005-06, cotton crops have been much lower than shown as the drought impacts became severe and led to low irrigation water allocations in most regions.

Table 7-2: Summary of Key Economy Measures

Measure	Narrabri	Moree	Narromine	Warren	Darling Downs
Gross Regional Product 2005-06 \$m	520	605	205	110	1,278
Employment – workplace 2006	5,350	5,691	2,159	1,105	14,450
Diversity Index	30.1	28.8	33.0	48.2	25.3
Cotton Growing Share of GRP (%)	19	29	11	22	6
Cotton Research Share of GRP (%)	1.7	0.3	-	-	0.04
Agriculture Share of GRP (%)	28.4	43.7	34.8	44.2	17.6

Some of the features of the case studies include:

- The regions varied in size by a factor of about 12.
- The smallest region economies were also the most remote, while the largest economy is the least remote.

- The diversity index is lowest (= most diverse economy) for the larger and least remote economies. However, even at 25, that indicates a relatively specialised economy.
- The share of cotton in the economy is largest in Moree and Warren as specialist agricultural economies, but is smaller for the more diversified economies (Narromine and Darling Downs). Narromine gains its status by way of its access to nearby Dubbo.
- Cotton research is of negligible importance except for Narrabri.

The development opportunities for these regions vary considerably. Only the Darling Downs region has a record of steady growth (and even then it is mainly in the Dalby urban area). For the remaining regions, economic development to build industry and market diversity is a high priority.

In the case of Narrabri and the Darling Downs, there is the potential for some large energy developments with various projects already under way with more planned. The opportunities stem from access to coal and gas resources that can be mined and exported or used in locally based power generation and consumption. These developments will boost growth, although the capital intensive nature of these developments will limit the impact on the local economy. Some gains will be made in terms of diversity but the primary industry base for those economies will remain with the associated implications.

All of the economies will make significant gains in diversity if they can build a larger share of their economies around knowledge and technology based industries, especially those that can service markets beyond the local region. There is accumulating evidence that it is small businesses (less than 20 employees) that create most jobs and are emerging as the focus of economic development strategies and projects. This potential needs to be explored in all regions but especially Moree, Narrabri and the Darling Downs. There could be some potential in Narromine as a satellite of Dubbo. Warren is much more conjectural because of its remoteness. However, both Warren and Narromine show evidence of large leakages of expenditures from their region. Some careful consideration and analysis of local businesses that have potential to slow those leakages would be warranted as they attempt to define the role that the urban centres should play in those communities. Further, some more work needs to be done in making remoteness a valuable attribute. In Warren's case, consideration should also be given to ways in which the world class Macquarie Marshes can best be used commercially in ways that have been successful in Botswana.

There are other comments on the particular regions in the case study presentations.

7.5 THE ECONOMIC DEVELOPMENT FUTURE

Regional development is part of the policy and activities of all levels of government. The analyses of the case study economies indicate only slow improvement in overall growth and the development of a more diverse economic structure. It is appropriate to question why this is the case given the programs and resources that have been allocated under the regional development heading. The following comments are both personal and research-based and are designed to promote discussion about some new thinking that is emerging about economic development in the USA.

Regional development is about building the wealth of the community through the growth of economic activity and related activities. That growth can arise from a small number of broadly-defined sources, namely:

- Deriving additional value from the region's natural resources.
 - More intensive use of the natural resources by existing or new businesses,
 - Finding new uses for the natural resources, and
 - Finding and using natural resources that were not previously known.

This has been the basis for much of the development of the case study regions and for some, there are new opportunities related to coal and gas resources. However, the nature of those developments will mean that the development will usually be undertaken by large corporations operating a branch in the region rather than having all of their business activities in the region. That reduces the regional impact of those developments relative to those undertaken by smaller local firms.

- Developing new businesses that are primarily based on technology, knowledge and human capital. This could be through expanding existing businesses or through the recruitment of businesses from elsewhere. The attraction of these activities is their low dependence on natural resources, the diversity of products they produce and markets they service. These industries are an important part of building a more diverse and robust economy. But it will take considerable time and persistent effort to achieve success. To date, Narrabri has been successful in developing a cluster of cotton industry technology and other activities that fits this avenue of development.
- In some cases, a locality may grow because of its proximity to a larger nearby centre that is growing with some of that growth spilling into a nearby centre. A significant part of the resultant activities is the large array of products and services that are needed by the modern household. This is notable in the case of Narromine and in some parts of the Darling Downs where Toowoomba is within reach.

The above represent opportunities for a region that have to be turned into business activities. In other words, the focus has to be on business development (business creates wealth, governments redistribute wealth). For a variety of reasons not discussed here, the share of regional development resources allocated to business development is modest. That led Keniry (2003) to comment that in many regions, businesses were not able to access easily the various specialist resources they need to run a successful and modern business.

Research in the USA over the past decades is now providing some new insights into economic development. That research is unlikely to be replicated in Australia because of privacy constraints. But the focus has been on uncovering the sources of growth in economic activity in economies and communities of all sizes.

On the positive side, there is a growing recognition of the role of the entrepreneurial firm: or more particularly the entrepreneurial managers of those firms. These businesses lead the economic development process and from their own success, the spillover impacts flow on to many other businesses. The entrepreneurial firms are a small proportion of all businesses (less than 10 per cent), tend not to be industry specific, and span the range of business size and location. It is probable that a strong desire to innovate and grow the business is critical – the personal attributes of the key business operator and/or manager.

On the negative side, the branch operations of large businesses located in regional centres have a patchy record. They tend to be operated in ways that minimise costs as their main competitive weapon (relative to the niche marketing approach of smaller firms). The structure results in minimal management and other linkages within the local community where the branch is located.

The US work is suggesting that a number of changes could be made to the way the economic development part of regional development might be undertaken in these cotton communities (and regional Australia generally):

1. There needs to be a focus on business development led by entrepreneurial businesses with potential to grow and a passion to grow the business. There will be a need to gain experience in selecting the businesses to support. The support provided will be mainly building business capacity and networks (not \$ of capital grants). The participating businesses can also include a focus on those industries that can build the diversity of products and markets serviced by the region.
2. Less emphasis would be placed on business recruitment. However, some business recruitment will be necessary to build the industry value chains that will enhance the region's existing and prospective industries. In other words, the recruitment should be carefully targeted

to filling gaps in value chains or seeding the development of new technology and knowledge-based industries.

3. There will be a restructuring of the staffing and work program of the regional development programs. More information will need to be gathered about the economic structure of the regional economy (such as in this report) and the businesses that comprise those industries. Careful planning of the business support and development programs will be required so that the programs are operated by persons who can gain the respect and trust of the participating businesses.

All of these possibilities exist within the cotton regions to some degree. In the past, most of the development has been built around the natural resources of the regions. There has been some development of technology-based industries but for most regions it has been limited. More effort has been expended on business recruitment than on assisting existing local businesses (often small businesses) to grow rapidly. Further refinement and testing of the strategy to grow existing local businesses would be warranted.

Some US resources that might be useful for those considering modification and extension of economic development programs are listed below. That includes some of the work involved in building an entrepreneurial culture into regions.

www.rupri.org/entrepreneurship.php

<http://youreconomy.org>

<http://www.energizingentrepreneurs.org/content/cr.php?id=1&sel=1>

<http://www.littletongov.org/bia/economicgardening/default.asp>

www.sba.gov.au see Zoltan, J., William Parsons and Spencer Tracey (2008), *High Impact Firms: Gazelles Revisited*, Report to the Office of Advocacy, Small Business Administration.

The attachments include an example of the work being done at the Edward Lowe Foundation.

7.6 SOME RECOMMENDATIONS

The following recommendations are generic in nature and are focused on the building a more active economic development strategy to generate growth in the economy and to build diversity in the industry structure. These objectives should be specified to improve the performance relative to the results achieved in the past. Each of the recommendations will need to be tailored to the particular circumstances of the region.

1. Each region needs to establish a timetable for the compilation of economic indicators. This timetable has to be built around the five-yearly censuses of population and agriculture. That will entail a significant time lag to allow for the publication of the necessary data (a

problem that was encountered in this work). As a result, these indicators are of most value in setting up and reviewing progress on key economic development strategies rather than being useful for on-going management purposes.

2. Identify and develop a process to gather relevant economic indicators of local business conditions. These should be at the minimum annual data but could be as frequent as monthly (eg. retail sales data) which can be used to identify seasonal patterns in business activity. The main purpose of these indicators would be to provide information that is of use in business management and operations. The indicators need to be tailored to key strategies, the needs of business and the cost of collection and analysis. It will include investigating the use of new technologies to make timely predictions of agricultural production (the most important industry in the studied regions) to assist management of the economy and the businesses within it.
3. Establish a long-term strategy to diversify the industry structure of the regional economy. In particular, the strategy should seek to build the share of knowledge and technology based industries to reduce the exposure to natural resource based activities and the commodity markets that they serve. These new industries will be additional to existing activities and need not involve a trade-off that involves the reduction of existing activities. The seeds of the new industry developments are likely to reside in some of the businesses that already exist in the region.
4. Build a strategic approach to the recruitment of businesses to the region. Business recruitment should be used to fill gaps in key industry value chains, add to an existing cluster of activities (such as in Narrabri with cotton research activities) or form the basis of a new industry cluster. This aspect of the strategy has to work consistently with the initiatives under 3 above.
5. Build a business support program that has the objective of supporting existing local businesses with potential to grow and to trade into extra-regional markets. For most regions, this will focus on predominately small locally-owned and operated businesses that have strong competitive characteristics and maximise their linkages with the rest of the regional economy.

The above all represent actions and strategies that are not well developed in any of the case study regions at present. This will represent a real challenge. However, the analyses in this work has indicated that existing economic development programs are not generating either high growth in the regions or leading to greater diversity in the economic structure of the regional economy.

Attachments

INPUT-OUTPUT METHODS

Input-output methods

Input-output models are an established part of the system of national accounts and are integral to the estimation of Gross National Product (GNP). (The detailed tables are published by the ABS (Cat No 5209.0) which includes details of the model, the classification system (shown later in this Attachment) and the relationship to the national accounts.) The input-output tables detail the interindustry trade that occurs among industries in an economy. The tables are constructed on a 'double entry' system that ensures that the supply of product from any industry has to be equal to the use of the products of that industry including any exports and imports and stock changes.

The input-output table has an important role in describing the economic structure of an economy, in particular the nature and intensity of interindustry trade. A subsistence economy where all business/household entities are self-sufficient will have no interindustry trade. Economic development involves an increase in the level of interindustry trade as businesses and households specialise in the production of goods and services and trade with other entities for the supplies that they need. The consistent development of input-output tables under a set of conventions makes it possible to compare these characteristics of an economy at different points of time and to compare economies in a consistent way. For this study, input-output tables are used to describe the economic structure of the NSW WS regions.

The interindustry linkages are the basis of flow-on effects that occur when one industry has an impact on other industries. Those flow-on impacts will operate through:

- Changes in the demand for inputs by the affected industry, or
- Changes in their production that will impact on the downstream marketers, handlers and users of the product.

The model is structured in a way that it is mathematically possible to estimate those effects through the use of 'multipliers'. Larger multipliers indicate that there is a high level of interindustry trade among the affected industries. This study is an analytical application of input-output models to estimate the flow-on effects to the regional economy from the activities affected by the declaration of the MP and associated zoning plan.

The multipliers are calculated on the basis of a number of assumptions. The most important are:

- A linearity assumption that implies that any change has proportionate effects throughout the economy so that there are

no substitutions among inputs and products. That applies to both inputs used in production and goods and services used in consumption. This assumption may not be critical over a range of types of change and price changes where it takes time to adjust production systems. There is a general concern in that production systems involve a set of fixed costs that do not change in response to short-run adjustments in production. In consumption, the same effect occurs in relation to discretionary and non-discretionary expenditures on goods and services. The estimated multipliers reflect the long-run effects after all of the adjustments have occurred. In that case the linearity assumptions need to be viewed in a context of possible structural changes that may occur in the industry or economy.

- A set of homogeneity assumptions that mean all of the entities in the specified sectors are the same in terms of production technology, products produced, goods consumed, etc. This is probably the most critical assumption given that the modern economy is comprised of such a multitude of differentiated products and production systems. These are aggregated into 106 sectors or groups that are intended to be similar within those groups. As a result, there is an important initial task in any impact analysis to make an assessment of whether the 'average' structure that appears in the sector to which an industry belongs is appropriate for the analysis. If it is not, then a separate sector needs to be compiled.
- There is no consideration of market effects in the input-output model and all results are based on real changes in production of goods and services. There can be a range of price effects that may influence outcomes including changes in input prices, product prices, wages and interest rates. Exchange rate changes may also be an important factor in price changes. For most studies of regional industries, these price effects will not be critical issues because of the small size of those industries relative to national and sometimes international markets..

The use of input-output models is justified in a number of ways.

1. The input-output models can be readily compiled relative to other types of models that include market effects.
2. In assessing regional impacts, many of the industries that will be affected are likely to be a small proportion of the total market for that industry so that any price effects are likely to be small.
3. The analyses can be easily carried out and the tools can be used in ways that allow analysis of variations of the scope of the MP and the way the zoning is implemented.

Constructing the Tables

The region tables are compiled using the GRIT method developed at the University of Queensland and widely applied in Australia for the construction of state and region tables. GRIT is a hybrid method that involves the use of available data combined with computer-based computations to develop the detail of the table. For a description of the method, see West (1990). CARE has used variations of this method over two decades to estimate tables for NSW and for the compilation of tables for regions within NSW.

The major source of data is the ABS and particularly the Population Census that is the only source of detailed data on employment by industry. As a result, most tables are constructed for population census years, the most recent being for 2000-01. Projected tables for future years are generally built on projecting the most recent population census employment data into the future.

The Multipliers

The multipliers calculated from the input-output tables and used in these analyses are shown as comprising the following:

- The **direct effect**, which is the gross output (total sales or the actual expenditures) of the product or service;
- The **production-induced effect**, which shows the flow-on effects generated through the purchase of goods and services to produce the good or service;
- The **consumption-induced effect**, which shows the flow-on effects that are generated through the payments of wages and salaries to households and the subsequent expenditure of those incomes of purchasing household goods and services;
- **Total Flow-on**, which is the sum of the production-induced and consumption-induced effects;
- **Total impact**, which is the sum of the direct and total flow-on effects; and
- **Type II** which is a ratio between the total impact and the direct effect.

All of these multipliers are what are described as “Final Demand Multipliers”. This means that they are calculated as if the direct effects are sales to final demand (to consumption, exports, capital formation or government consumption). The multipliers are used by applying the appropriate value to the gross output value to estimate the total impact. The multipliers should be interpreted as ‘indicating the flow-on effects generated by a \$1 change in gross output (in the case of employment it is \$1m).

The multipliers are calculated for the following measures:

Gross output, which is equivalent to business turnover;

Value added, which is the payment to labour and capital,

Household income is the wage and salary component of value added, but including an imputed wage for self-employed labour. (This approximates Gross Regional Product.)

Employment, which is the number employed unadjusted for hours worked or other factors.

Reference

West, G. R. (1990), Regional trade estimation: a hybrid approach, *International Regional Science Review*, 13 (1 & 2), 103-118.

The ANZSIC Industry Classification

Sector Aggregation	109 IO Sectors
Sheep	Sheep for meat and wool
Grains	Grains inc. cereals, oilseeds, legumes
Beef Cattle	Beef cattle
Dairy Cattle	Dairy cattle
Pigs	Pigs
Poultry	Poultry for meat and eggs
Other Agriculture	Other agriculture, inc. nurseries, vegetables, fruit, cotton, tobacco, sugar cane, herbs, hay, goats, horses, deer, beekeeping, pet breeding.
Services to agriculture	Cotton ginning, shearing and wool classing, aerial ag services, contract harvesting, seed grading, land clearing; hunting
Forestry	Forestry and logging
Fishing	Commercial fishing and aquaculture
Mining	Coal
	Oil and gas
	Iron ores
	Non-ferrous metal ores
	Other mining inc. construction materials
	Services to mining inc. exploration
Food Mfg	Meat and meat products
	Dairy products
	Fruit and vegetable products
	Oils and fats
	Flour and cereal foods
	Bakery products
	Confectionery
	Other food products inc sugar, seafood, animal/bird feed, spices, herbs, savoury snacks, tea, honey - blended etc.
	Soft drinks, cordials, syrups
	Beer and malt
	Wine and spirits; and tobacco products
	Textile Mfg
	Textile products inc. blinds, awnings, curtains, sails, tents, carpets, rugs, ropes, nets, string, cord, bags, sacks etc.
	Knitting mill products
	Clothing
	Footwear
	Leather and leather products
Wood Mfg	Sawmill products inc sawn timber, woodchips, dressed timber, plywood, veneer, fabricated boards
	Other wood products inc. structural components - windows, doors, trusses, frames, containers, pallets, cases, log preservation.
Printing/Publishing	Pulp, paper and paper-board
	Paper bags and products
	Printing; services to printing
	Publishing; recorded media etc
Chemical Mfg	Petroleum and coal products
	Basic chemicals inc. fertilisers, industrial gas/chemicals, synthetic resins, dyes, acid, salt, urea, fluoride, chlorine etc.
	Paints
	Pharmaceuticals etc inc. drugs, medicines, medicinal preparations
	Soap and detergents
	Cosmetics and toiletries
	Other chemical products inc. explosives, ink, glue, polish, cleaners
	Rubber products
Plastic products	
Mineral Mfg	Glass and glass products
	Ceramic products

Sector Aggregation	109 IO Sectors
	Cement, lime and concrete slurry
	Plaster; other concrete products
	Non-metallic mineral. products nec inc. abrasives, chalk, stone products, insulation materials, ag/hydrated/quick lime,
Metal Mfg	Iron and steel rolling, galvanising, casting, forging, pipes and tubes
	Basic non-ferrous metals inc alumina, aluminium, copper, silver, lead, zinc, gold, bronze, nickel, tin – smelting, refining, rolling, drawing, extruding, casting, forging
	Structural metal products inc girders, reo-mesh, architectural products, doors, gates, windows etc
	Sheet metal products inc. containers, guttering, downpipes, tanks
	Fabricated metal products inc. tools, general hardware, springs, wire, nails, nuts, bolts, screws, rivets, metal coating, non-ferrous pipe fittings, miscellaneous metal products
Mach/Equip Mfg	Motor vehicles and parts etc
	Ships and boats
	Railway equipment
	Aircraft
	Scientific etc equipment inc photographic, optical, medical, surgical
	Electronic equipment inc. computer, telecommunication, radio, TV
	Household appliances
	Other electrical equipment inc. cable, wire, batteries, lights, signs, fuses, electric motors, generators, welding equip. etc
	Agricultural, mining, construction machinery inc lifting/handling
	Other machinery and equipment inc. food processing, machine tool/part, pumps/compressors, commercial heating/cooling equip.
Other Mfg	Prefabricated buildings
	Sheet metal, wooden and upholstered furniture, mattresses, pillows, cushions (not rubber)
	Other manufacturing inc jewellery, toy, sporting goods, brushes, miscellaneous goods
Utilities	Electricity generation, distribution and supply
	Gas distribution and town gas mfg/dist. Via mains
	Water supply, sewerage and drainage services
Residential Building	Residential building
Other Construction	Non-residential building, Non-building construction inc. road/bridge, earthmoving, irrigation, mitigation
Construction Trade Svcs	Construction trade services
Wholesale Trade	Resale of new or used goods to business or institutional users.
	Wholesale mechanical repairs
	Other wholesale repairs
Retail Trade	Resale of new or used goods to final consumers for personal or household consumption eg main-street establishments
Mechanical Repairs	Mechanical repairs
Other Repairs	Other repairs in. household equipment repairs etc
Accommodation	Accommodation inc. hotels, motels, guest houses, youth hostels, student residences, camping grounds, caravan parks; cafes & restaurants; hospitality clubs, pubs, taverns and bars
Restaurants	
Road Transport	Road freight and passenger transport
Rail Transport	Rail; pipeline; other inc. cable car, chair lift etc
Water Transport	International, coastal, inland water transport inc sea freight, cruise operation, boat charter, ferry.
Air Transport	Scheduled domestic and international air transport and non-scheduled air & space transport.
Transport Services	Services to road, water and air transport; travel agency, freight forwarding, customs agency; storage
Communication	Postal, courier, telecommunications
Banking	Reserve Bank; development, savings and trading banks
Non-bank Finance	Building societies, credit unions, money market dealers, deposit taking financiers, financial asset investors etc

Sector Aggregation	109 IO Sectors
Insurance	Insurance and services
	Services to finance and investment inc. brokers
Ownership of dwellings	Residential Property Operators
Property Services	Commercial property operators and developers, real estate agents, non-financial asset investors, machinery and equipment hiring and leasing
Technical, Computer Services	Scientific research, architectural, surveying, consultant engineering, other technical services, data processing, information storage and retrieval, computer maintenance and consultancy services.
Legal/Account/Mgt/Mkt'g	Legal, accounting, advertising, commercial art and display, market research, business administration and management services
Other business services	Employment placement, contract staff, secretarial, pest control, cleaning, packing, etc.
Public Administration	Federal, state, local government administration; justice
	Defence
Education	Education
Health	Hospitals, nursing homes, medical and health services; veterinary services
Community Care Services	Child care, accommodation for the aged, residential care services
Entertainment/ Media	Motion picture, film and video, radio and television
Cultural	Libraries, museums, parks and gardens, arts
Sport, Gambling	Sport, gambling and other recreation services
Personal Services	Personal and household goods hiring; laundries, drycleaners; photographic studios and processing, funeral directors etc, gardening, hairdressing etc; private households employing staff
Other Services	Religious organisations; Interest groups - business and professional associations; Public order and safety

Data from the USA on Business Growth



For immediate release
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New data shows that expanding companies have a greater positive influence on net new jobs than new or relocated companies

CASSOPOLIS, Mich. — When it comes to economic development, the recruitment of companies typically takes center stage and grabs headlines. Yet what really drives new jobs is the expansion of existing, local companies, according to YourEconomy.org (www.youreconomy.org).

Launched earlier this year by the Edward Lowe Foundation, YourEconomy initially provided data about the composition of state and regional business communities according to establishments and jobs. Now YourEconomy is introducing a “growth” section that follows individual establishments as they open and close, expand and contract, and move in and out of regions — along with the resulting impact on jobs.

“Among other compelling trends, our new data shows that expanding companies are the linchpin for job growth,” said Mark Lange, executive director of the Edward Lowe Foundation. “This is especially true when compared to the jobs gained from opened or relocated companies.”

For example, from 1997-2007 net new jobs in Colorado increased by 11.58 percent:

- 14.29 percent increase coming from expanded establishments (jobs gained from companies that expanded minus jobs lost from companies that contracted).
- 2.98 percent decrease coming from opened establishments (jobs gained from companies that opened minus jobs lost from companies that closed).
- 0.28 percent increase coming from relocated establishments (jobs gained from companies that moved into the designated region minus jobs lost from those that moved out).

During the same period in New Mexico, net new jobs increased by 6.23 percent:

- 8.95 percent increase in jobs from expanded establishments.
- 2.31 percent decrease in jobs from opened establishments.
- 0.42 percent decrease in jobs from relocated establishments.

The period used in the examples above includes up and down economic cycles surrounding the impact of Sept. 11, 2001. In both of these examples, job gains from expanded establishments outperformed jobs gains from opened and relocated establishments. YourEconomy allows visitors to customize data views by selecting different time periods, and they can see how expansions have an even more dramatic affect during slower economic times.

Another piece of the job-creation story is the role played by resident establishments (those headquartered in



Net new jobs came from:
 Opened Establishments (opened - closed): -2.98%
 Expanded Establishments (expanded - contracted): 14.29%
 Relocated Establishments (moved in - moved out): 0.28%
Net New Jobs: 11.58%

Figure 1: Data for Colorado (1997-2007)

YourEconomy.org

the same state) — a new classification introduced by YourEconomy. Resident companies make a significant contribution to net new jobs when compared to companies headquartered outside of the state.

Take California, where from 1997-2007 jobs generated by resident establishments grew by 11.9 percent (a gain of about 1.3 million). In contrast, jobs generated by nonresident establishments dropped by 5.4 percent (a loss of 169,034).

During a slower economic period in California (2002-2007), data shows that jobs generated by resident establishments dropped 2.3 percent (a loss of 281,021), but jobs generated by nonresident establishments dropped even more — 16.4 percent (a loss of 579,945).

Although numbers may vary from region to region, looking at the performance of expanding and resident companies confirms the importance of “economic gardening,” an entrepreneur-centric strategy that focuses on helping local, existing companies grow, Lange said.

“We’re not saying that recruitment is wrong, but there has been an overemphasis on these activities due, in part, to competitive and political pressures,” he explained. “Balance is the key to building effective programs and strategies. YourEconomy provides a new lens for a different way of thinking about who to focus on, how to help them and what to measure.”

State data is available now, along with some county data, beginning with more current years. (County data for Michigan, California and Florida is already complete.) County and MSA datasets are expected to be fully loaded on the site by mid-November. Site visitors should check regularly for updates.

“YourEconomy provides a more complete picture of net new jobs, which is a standard metric in the economic-development arena,” Lange said. “It allows you to look beyond the total numbers to see how job creation happened — or didn’t happen — and what types of companies were responsible. This is critical to developing effective economic-growth policies, allocating resources and measuring results.”

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About YourEconomy.org: A free online research tool, YourEconomy is designed to provide timely, accessible data about business activity to nonresearchers. In particular, it is aimed at individuals and groups that work directly with businesses and entrepreneurs to support economic growth. This includes economic developers, entrepreneur support organizations, membership organizations, and public and private business-development groups.

Data for YourEconomy is drawn from the National Establishment Time Series (NETS), a longitudinal database that tracks the performance of more than 33 million business establishments from 1990 to 2007. Although researchers have used NETS for regional projects, the foundation is NETS’ first national subscriber.

Please note that YourEconomy includes non=employer numbers (sole proprietors and partnership establishments), which dramatically increases the number of establishments and jobs that are normally tracked. In addition, YourEconomy includes numbers for establishments and jobs in agriculture-related and other industries that many statistical sources don’t include. For more information about NETS, see “About the data source” at www.youreconomy.org/guide/?region=Guide.

YourEconomy initially focused on composition, showing the breakdown of companies and jobs in regions according to three employer categories and four business stages (new classifications created by the foundation to help gain greater insight into business activity). The growth section uses these same categories, but provides richer data and special features: a “growth details” page shows numbers for openings, closings and relocations of establishments — and how this activity, along with expansion, affect job gains and losses. In addition, a “summary” page gives a quick explanation of trends, showing graphs and percentages for net new establishments and net new jobs.

About the foundation: Established in 1985, the Edward Lowe Foundation is a nonprofit organization that supports entrepreneurship through research, recognition and educational programs, which are delivered through entrepreneur support organizations (ESOs). The foundation focuses on second-stage companies — those that have moved beyond the startup phase and seek significant, steady growth. The foundation also encourages economic gardening, an entrepreneur-centered strategy providing balance to the traditional approach of business recruitment.

