
# A Scoping Study on Socio-Economic Indicators for the Cotton Industry

**Report to the Cotton Research & Development Corporation**

Cotton
Research & Development


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# CONTENTS

# EXECUTIVE SUMMARY

## *Aims of the Study*

The 1998-2003 strategic plan of the Cotton Research and Development Corporation (CRDC) set research goals in three main areas: (i) sustainability, (ii) profitability and competitiveness and (iii) people and communities. This study contributes to the last of these areas by developing a framework for monitoring the socio-economic impacts of the cotton industry on people and communities in the cotton growing regions. The specific aims of the study are to:

- identify long term trends in the cotton industry that are likely to show socio-economic impacts in the cotton growing regions,
- identify the main linkages between the cotton industry and the regional economies in the cotton growing regions,
- gain an appreciation of the socio-economic impacts that are currently being experienced in the cotton growing regions due to changes in the industry, and
- identify the important socio-economic impacts that the industry will need to monitor in the medium term, and propose appropriate socio-economic indicators to do this.

## *Pressures on the Industry*

The cotton industry faces global competitive pressures as do many other primary industries. Within Australia, cotton production appears to be stabilising in some regions, such as the Gwydir and Namoi valleys, while it continues to increase in others. Cotton research and development has played an important role in the introduction of new transgenic cotton varieties, the steady increases in yields and the improvements in management that are underpinning productivity growth. Management is becoming more knowledge-intensive, while the demand for spraying and chipping services is decreasing. The availability of irrigation water will remain an important issue for the industry. Growers have already made significant adjustments to improve water efficiency and this can be expected to continue in the medium term. The economic and social changes occurring within regional economies and communities can no longer be understood solely in terms of the changes occurring in primary industries. This means that care has to be taken in identifying changes attributable to the cotton industry. The causes of these changes are clearest where cotton dominates agricultural production and the size of the non-farm economy is relatively small. In other areas, broader changes in community aspirations, retailing and transport may result in social and economic impacts that outweigh any effects of the cotton industry. Compared to most other agricultural industries, however, the cotton industry with its input and knowledge intensiveness and local processing is more likely to have impacts on regional economies.

## *Linkages with Regional Economies*

The part of the cotton supply chain that has the greatest impact in rural areas is that from cotton growing through to lint production. With the knowledge intensity of cotton production, there is a particularly large and diverse range of firms and organisations providing physical and informational inputs to the industry. Among these inputs, the proportion of expenditure by cotton growers that is retained locally ranges from very small (e.g. chemicals where only the retailer's margin is retained locally, with the remainder going to wholesalers and manufacturers outside the cotton growing regions), to a very large proportion (e.g. consultant agronomists who spend most of their income locally). The cotton industry also has an important effect in some regions through the economies that occur due to the concentration of knowledge intensive services and due to the building of social capital.

Given these linkages between the cotton industry and regional economies and communities, changes in the industry are likely to have flow-on effects in these economies and communities. There are a range of social and economic indicators available from secondary data sources that provide a measure of the vulnerability of communities to these changes. These include indicators relating to population change, age distribution and ethnicity, unemployment, education and skills, and a number of indicators relating to social well-being.

### *Impacts within Regional Economies and Communities*

In interviews with key informants in the Namoi and Gwydir Valley cotton growing regions, a number of people were able to identify changes they were experiencing that were a direct result of changes occurring in the cotton industry. These included falls in employment in chemical retailers, an increase in demand for steel fabrication work due to aggregation of cotton farms and compliance with OH&S requirements, and falls in employment in the oil seed crushing industry

However, there were also changes occurring in towns in the Namoi and Gwydir Valleys that were symptomatic of the broader changes occurring in rural Australia. For example, some of the smaller towns in the Namoi and Gwydir cotton growing regions appeared to be losing some retail service functions to the larger centres, due to the growth of the latter and consequent expansion of retailing diversity, and the improvement in road infrastructure.

There are, then, two sources of change within the socio-economic fabric of the cotton growing regions: the cotton industry itself, and the generic pressures that all rural areas in Australia are experiencing.

### *Key Impacts for Future Monitoring*

In the case of the cotton industry, there are three areas in which monitoring of impacts would be desirable:

- the immediate impacts in the cotton growing regions of changes in the volume and value of cotton production due to such factors as global price fluctuations and variation in the availability of irrigation water,
- the changes in the demand for unskilled labour in the industry and the well-being and opportunities for those who can no longer find employment in the industry, and
- any changes that are occurring in the levels of social capital within the cotton growing regions that may threaten social cohesion of communities and their ability to work together and with natural resource managers in developing the institutions needed in allocating scarce water resources.

The generic pressures that all rural areas experience may result in the industry having increasing difficulty in attracting to the cotton growing regions the high levels of human capital that a knowledge intensive industry requires. In addition, the out-migration of younger age groups in rural areas decreases the pool of talent available for entry level positions in the industry. For these, and other, reasons, it is in the industry's interest to monitor these generic changes in the cotton growing regions, so that it is in a position to respond in a pro-active way when needed.

### *Socio-Economic Indicators*

Measurement of social and economic indicators in rural areas undergoing change has gained increasing interest in recent years. While, as yet, there is no 'standard' methodology, experience is being gained in a number of indicator projects around Australia. It is recommended that indicators be compiled in a number of areas, including:

- basic production indicators and indicators relating to the direct linkages between the industry and its service industries;
- human capital indicators that measure the stock of human capital, the movements of skills into, and out of, the cotton growing regions and the levels of employment of this capital;
- social capital indicators that provide surrogate measures of the ability of rural communities to adapt to change; and
- general rural indicators to provide information on broad long-terms trends that may be significant for strategic directions in the industry.

The report provides a detailed description of a series of surveys and reviews, supported by basic research, through which indicators in the areas above can be regularly measured. The timing of surveys and reviews, and the relationships between them is described and details of recommended methods and coverage provided. Indicative program costings are also provided, ranging from $92,000 p.a. for a low cost option, to $318,000 p.a. for a high cost option. By focussing on just three sub-programs, and combining two of them, it would be possible for CRDC to commence social and economic indicator research with a budget of less than $50,000 p.a.

# ACKNOWLEDGMENTS

The contribution of cotton industry leaders and those in the cotton industry and its service industries in the Namoi and Gwydir valleys who participated in interviews is gratefully acknowledged.

# 1. INTRODUCTION

During the 1990s, cotton production in Australia has increased significantly, from 1.907 million bales in 1990-91 to 3.404 million bales in 2000-01 (Cotton Australia, 2003). This growth has occurred in regions where cotton has been grown for some time (the mature cotton growing regions, such as the Gwydir and Namoi valleys), and in regions where cotton is a relatively new crop (the newer cotton growing regions, such as the Dirranbandi, Bourke, Narromine and Hillston districts). The industry has also contributed to the economy of rural areas remote from where cotton is grown such as Tamworth, Armidale and Quirindi, and even to the economy of metropolitan areas. The involvement of the University of New England at Armidale and the University of Sydney in the Australian Cotton Cooperative Research Centre is are examples of such contributions.

Although there are some differences in types and scales of the interactions between the industry and regional economies in the mature and new cotton growing regions, the industry has nonetheless made substantial contributions to the economies of these regions. There have also been a number of social impacts of the cotton industry within the cotton growing regions, many of them the result of economic impacts.

The 1990s was also a period of increasing policy attention to environmental issues in rural areas. A number of significant policy initiatives, such as the Natural Heritage Trust and the COAG water reforms have brought environmental considerations into prominence for the agricultural industries. Also during the 1990s, there have been growing expectations that industries will accept a certain level of social responsibility. A number of corporations and whole industries have responded initiating their own programs to meet these expectations. Triple bottom line accounting is one approach being used and has been adopted by the Cotton Research and Development Corporation.

The cotton industry undertook its first Environmental Audit in 1990. The Best Management Practice program was introduced in 1997 and has been widely adopted among cotton growers. In addition, considerable effort has been devoted to the development of new cotton varieties and pest management strategies that can reduce the dependence on agricultural chemicals. While the industry has made substantial progress in meeting its environmental and social responsibilities, the latter is difficult to quantify and measure and will require on-going research.

The 1998-2003 strategic plan of the Cotton Research and Development Corporation (CRDC) set research goals in three main areas: (i) sustainability, (ii) profitability and competitiveness and (iii) people and communities. This study contributes to the last of these areas by developing a framework for monitoring the socio-economic impacts of the cotton industry on people and communities in the cotton growing regions. The specific aims of the study are listed below.

### *AIMS OF THE STUDY*

To identify long term trends in the cotton industry that are likely to show socio-economic impacts in the cotton growing regions.

To identify the main linkages between the cotton industry and the regional economies in the cotton growing regions.

To gain an appreciation of the socio-economic impacts that are currently being experienced in the cotton growing regions due to changes in the industry.

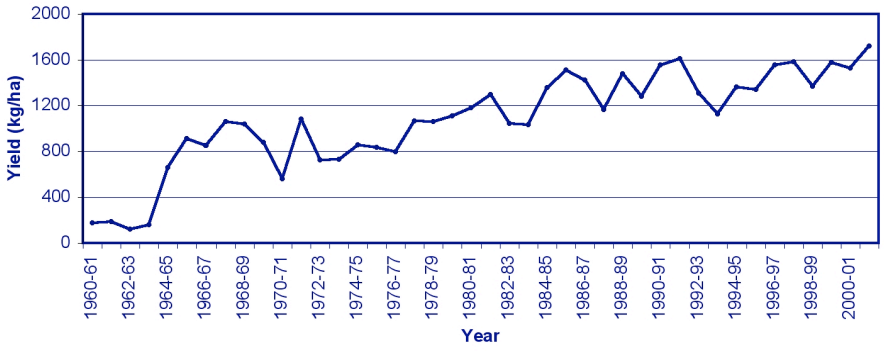
To identify the important socio-economic impacts that the industry will need to monitor in the medium term, and propose appropriate socio-economic indicators to do this.

The study provides information from secondary sources that is relevant to all the cotton growing regions in Australia. Primary information gathering through key informant interviews was largely confined to the Gwydir and Namoi valleys.

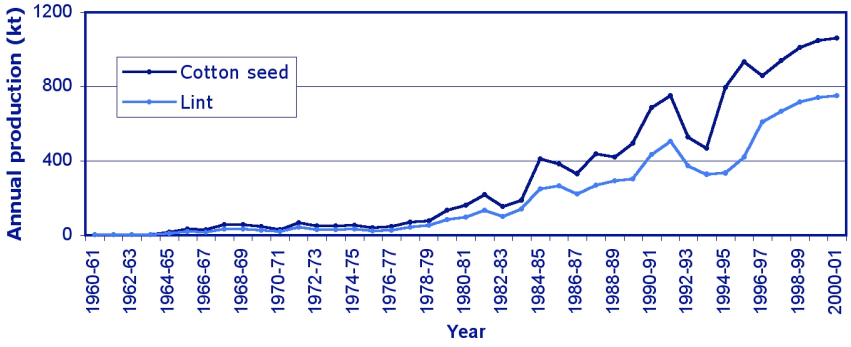
## BOX 1: THE AUSTRALIAN COTTON INDUSTRY AT A GLANCE

Cotton growing regions

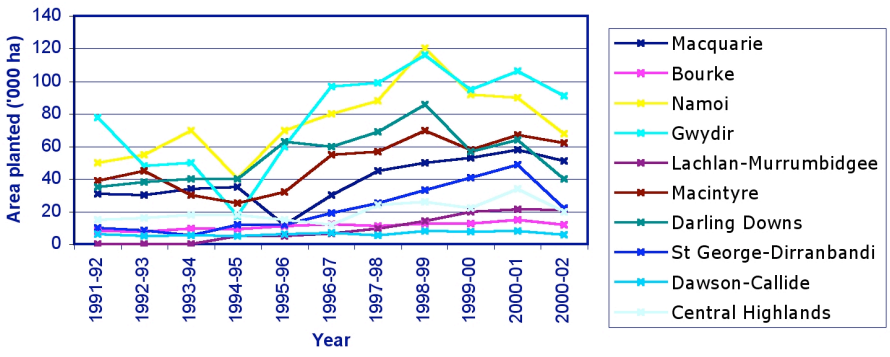

Cotton yields since 1960




Cotton seed and lint production since 1960




Areas planted by region since 1991



# 2. TRENDS IN THE COTTON INDUSTRY

## 2.1. Introduction

Like any other industry, the cotton industry is subject to a range of long term trends that materially alter conditions within the industry. These changes also have an impact on the industries that provide goods and services to the cotton industry. At the same time, these industries are experiencing their own pressures for change, and it is not always possible to draw a clear distinction between changes originating within the cotton industry itself, and those originating within the associated service industries.

Among the trends occurring in the cotton industry, it is possible to distinguish between those that are global in nature, and those that are specific to the Australian cotton industry. It is also possible to identify 'non-trends', i.e. aspects of the industry that are expected to remain fairly constant. Knowledge of these aspects enables research into, and monitoring of, the socio-economic impacts of the industry to be targeted efficiently.

The information in this chapter was compiled from a review of the literature and from discussions with a small number of key informants with extensive experience of the industry.

## 2.2. Global Trends

### *2.2.1. Price*

The long term trend in price of cotton has been steadily downwards, although there is considerable short term variability about this trend (ABARE, 2000, cited by Centre for International Economics, 2002).

### *2.2.2. Exchange rate*

The Australian dollar tends to move with the commodity price index and, for major commodity exporters, this provides a degree of hedging against exchange rate fluctuations. However, cotton is not a major commodity and so the industry faces more severe price fluctuations than the major agricultural industries. While there has been a fairly consistent long term depreciation in the Australian dollar, reflecting long term declines in commodity prices, future trends are unclear as the influence of commodities in the Australian economy becomes less over time. The cotton industry is likely to continue to face price volatility and the additional costs associated with managing price risk (Centre for International Economics, 2002). Exchange rates also affect the demand for Australian cotton seed in international markets.

### *2.2.3. Competition on global markets*

Competition with synthetic fibres and cotton produced in countries where production is subsidised by governments maintains downward pressure on cotton prices. Demand for the commodity synthetic fibres continues to outpace that for cotton although, in the short term, a period of world economic growth may create increasing demand for cotton.

Compared to some other commodities, the use of transgenic varieties has not resulted in significant consumer resistance. European markets are likely to remain sensitive in this respect, although these markets currently take only a very small proportion of Australian production.

## 2.3. Australian Trends

### *2.3.1. Area planted to cotton*

In the mature cotton growing regions of north-west New South Wales, the area planted to cotton is beginning to stabilise after a period of rapid growth (see Box 1). In areas such as southern New South

Wales, Queensland and the Ord, this limit has yet to be reached and expansions in the area planted to cotton are possible. The rate at which this occurs will, in part, be determined by the availability of cotton varieties suited to these areas, as well as by water availability and infrastructure.

As the area of cotton planted increases relative to the water yield of the catchments supplying irrigation water, and the size of irrigation water storage, the variation in area planted begins to more closely follow climatic variation (Box 1). Irrigation water storages tend to protect against the variability due to minor or medium droughts, but provide much less protection against the occasional severe drought, such as the 2002-03 drought. Consequently, as cotton growing regions mature, the regional economy can become more exposed to long return period climatic shocks, particularly if the economy is relatively dependent on the cotton industry. The graph for cotton seed and lint production in Box 1 shows the impacts on production of the droughts in the early 1980s and 1990s.

### 2.3.2. Yields

There has been a steady increase in the average yield during the 1990s (see Box 1). Much of this increase is a consequence of research into improved cotton varieties, crop management and technology adoption by growers and consultants.

### 2.3.3. Cotton quality

While it does not have the potential to impact upon regional economies to the extent that variations in water availability and area of plantings, the on-going improvements in the quality of cotton have been important in maintaining demand from textile mills. This in turn supports the cotton price and the potential for the purchase of goods and services by the industry from local firms.

### 2.3.4. Profitability of cotton growing

While there has been short term variability, the overall trend in profitability for the 1990s has been gradually downwards (Centre for International Economics, 2002).

### 2.3.5. Irrigation water

The availability of irrigation water is perhaps the most fundamental constraint on the future of the cotton industry in Australia. The prospects for new public on-stream storages in most of the cotton growing regions are extremely limited. Growing awareness of the impacts of irrigation on rivers has led to stronger demands to increase the water available for environmental flows. Global climate change will result in declines in available irrigation water in south-eastern Australia of the order of 10 to 30 per cent (Basher and Pittock, 1998; Hassall and Associates, 1998). Taken together, these factors suggest that the industry will face declines in the amount of surface water available for irrigation.

Reductions in groundwater allocations are currently being introduced in several cotton growing regions. In NSW, new groundwater sharing plans for 'priority groundwater systems' include the Upper and Lower Namoi, Lower Gwydir and Macquarie valleys. Where over-allocation of water has occurred in the past, water sharing plans are implementing sizeable reductions to access license volumes over a ten year period. For example, license volumes in all of the Lower Namoi are being reduced 51 per cent, whilst in the Upper Namoi, where 12 zones are identified, the average reduction is 50 per cent but required cuts range between 87 per cent and zero per cent in individual zones (Aquilina, 2003).

With the implementation of National Competition Policy in the water industry, it is likely that the prices charged by State water authorities will increase as they attempt to recover a greater proportion of the costs of operating and maintaining water infrastructure.

With these pressures on the price and availability of irrigation water, there have already been responses by cotton growers to improve their water use efficiency. Some efficiency improving technologies, such as better irrigation scheduling and tail and storm water recycling are already widely used. Some technologies that are being adopted in horticulture, such as drip irrigation, are likely to remain uneconomic with the current and foreseeable price of water. The pressures on the price and availability of irrigation water are likely to continue and intensify in the future.

However, one response to the current, and perceived future, pressures on water availability and price has been the aggregation of cotton growing properties into larger units. This enables efficiencies to be obtained in the pumping, storage and distribution of water. Aggregation appears to be happening mostly in the older, historically over-allocated cotton growing regions such as the Namoi and Gwydir valleys, where there is a greater proportion of relatively smaller properties with irrigation licences. The aggregation of adjacent properties is often followed by considerable modification of irrigation infrastructure, which requires new machinery and earthworks. On the larger properties that result from aggregation, rotation of cotton with other crops becomes a more feasible option, with the consequent benefits of greater crop diversity, and maintenance of soil structure.

Another possible impact of pressure on availability of water for irrigation is that water currently used on other crops might be used for cotton because of its higher returns per megalitre of water applied. This might have the effect of increasing the cotton-dependence of service industries and regional economies in some areas. Where climatic and soil conditions are suitable, there is also the possibility that high value horticultural crops might be planted on some areas currently being used for cotton production. There are, however, no indications at the moment that this is likely to occur to any significant extent.

### *2.3.6. Research directions*

The strategic directions pursued in cotton research and development may have long term impacts on the industry and, ultimately, upon the communities and regional economies in the cotton growing regions. For the research and development funded by industry levies and matching Commonwealth funds, these research directions are set by the Cotton Research & Development Corporation, based on consultation with the industry, analysis of research needs and national research priorities established by the Commonwealth Government. The most recent national research priorities were announced on 5 December, 2002.

The directions pursued during the period of the 1998-2003 Strategic Plan of the Cotton Research & Development Corporation emphasise three areas: environmental sustainability, profitability and competitiveness, and people and communities. The first two areas are reflected in research programs to improve the chemical and non-chemical management of insect pests, weeds and diseases, to increase the adoption of environmental management programs, to improve farm management and to increase returns through value-chain and market development. Private sector research and development has also responded to consumer concerns about agricultural sustainability. The outcome of the twin pressures of sustainability and profitability has been the increasing use of transgenic varieties of cotton and the resulting decline in chemical use.

### *2.3.7. Transgenic varieties and chemical use*

There has been a significant decline in the level of pesticide usage in cotton growing due to the introduction of Ingard. For example, over the last six years, endosulfan use has fallen by 57 percent (Cotton Australia, 2003). Surveys of matched pairs of Ingard and conventional cotton fields in recent years show that Ingard fields receive about half the number of spray applications that conventional fields receive (Doyle, Reeve and Barclay, 2002). With the introduction of resistance management strategies and new transgenic pest resistant varieties, these lower levels of chemical use are likely to be maintained. However, transgenic varieties are unlikely in the medium term to completely replace conventional varieties, due to the need for refuges as part of resistance management strategies.

The future impact in Australia of the introduction of herbicide resistant cotton varieties is not as clear, as these varieties have only been available in the last few years. Some studies in the USA have shown reductions in the use of herbicides with the introduction of these varieties, while others have shown that the level of herbicide use remained about the same (AFAA, 2002). A more significant issue for the cotton industry is, however, the impact of herbicide resistant cotton varieties on the demand for seasonal work in cotton chipping. The ability to control weeds in cotton crops by spraying over the top of the crop has the potential to reduce the need for hand chipping of weeds, with considerable cost savings. There are also new chemicals and application technologies being introduced that reduce the need for cotton chipping labour. Due to the recency of the introduction of these technologies, the impacts on seasonal workers are as yet unclear.

### 2.3.8. Increasing attention to OH&S

Implementation of the cotton industry's Best Management Practices and the use of the Managing Farm Safety Manual has led to the upgrading of chemical storage and handling areas on farms. This has resulted in significant investment in storage facilities and safety equipment. In some States, such as New South Wales, there has been increasing pressure from the State agency responsible for industrial occupational health and safety (OH&S) for the provision of guards and safety rails and enclosures around irrigation pumping machinery. This has led to increased demand for steel fabrication work.

### 2.3.9. Management of marketing risk

In the last decade, there has been an increase in services to manage marketing risk. By their nature, these firms can be located in areas away from the cotton growing regions, although many may employ local agents in these regions.

**BOX 2: SUMMARY**

The cotton industry faces similar global competitive pressures as many other primary industries. Within Australia, cotton production appears to be stabilising in some regions, such as the Gwydir and Namoi valleys, while it continues to increase in others. New transgenic cotton varieties, steady increases in yields and improvements in management and technology are underpinning productivity growth. Cotton research and development has played an important role in these improvements. However, the availability of irrigation water will remain an important issue for the industry. Growers have already made significant adjustments to improve water efficiency and this can be expected to continue in the medium term.

# 3. The Industry and the Regional Economy

The regional economies within which the cotton industry operates have been experiencing a range of forces that have changed their economic structure and social condition. This is the context within which the effects of trends within the cotton industry need to be understood. In other words, the cotton industry is only one of a number of factors that is responsible for economic and social change in these regions, even in those regions where it is the dominant primary industry.

This chapter commences with an examination of the main causes of change in regional economies and rural communities, before turning to one of the more important causes of change in the cotton growing regions, viz. the linkages between the cotton industry and regional economies. The chapter finishes by setting out in tables a range of social-economic indicators for the cotton growing regions, with particular attention to the Namoi and Gwydir Valleys.

## 3.1. Changes in Regional Economies

The economic and social linkages between the cotton industry and the regions within which it operates need to be understood within the context of a wide array of trends and factors that are changing the economic and social condition of rural Australia. Indeed, similar forces are changing the economic and social condition of rural communities in all advanced modern economies. In other words, the economic and social condition of, and trends in, rural communities can no longer be understood by focusing solely on the changes occurring in the primary industries that have traditionally been the dominant activities in rural regions.

Sources of change from within agriculture, however, include:

- the continuing substitution of capital for labour on farms, and the substitution of relatively mobile contract labour for employees, both of these factors leading to reductions in the number of people employed on farms and therefore reduced local populations and local spending;
- the movement of many of the value adding processes (both input suppliers and output processors) from on- or near-farm to more distant (and larger) rural communities, this trend often facilitated by improved transport and communication systems (roads, fax, phone, internet);
- the concentration of many input supply and output processing activities in fewer and larger facilities as a result of economies of size in processing, as well as other factors (see Stayner, 1999);
- fewer but larger farms, with increased non-local linkages relative to their local linkages; and
- the rising aspirations of farm people for access to a wider range of household goods and services and social contacts, leading to a possible weakening of their economic and social linkages with the smaller rural communities that are finding it increasingly difficult to provide these services.

Apart from sources of change originating within agriculture, the following factors have also altered the spatial distribution of economic activities amongst rural communities:

- changes in the economics of the provision of a wide range of private and public sector goods and services, usually in the direction of concentrating these in fewer and larger rural towns, in some cases resulting in what is known as the 'sponge city' effect;
- changes in government 'competition policy' with respect to the provision of public sector goods and services;
- the so-called 'knowledge economy', in which the increasing knowledge-intensity of modern goods and services leads to increased demand for people with advanced skills to provide and deliver those goods and services, but simultaneously a reduced willingness of such people to move to or remain in rural communities with declining economic and social amenities; and
- the increasing efficiency of transport and communications and the rising aspirations of rural people generally for access to a wider range of goods, services, and social contact and amenities.

## 3.2. Linkages between the Industry and the Regional Economy

### *3.2.1. Variation in cotton dependence*

The level of dependence of a particular region on cotton growing depends on a number of factors, including the amount of cotton grown in a region, the amount of cotton produced relative to total agricultural output in that region, and the size and diversity of the non-farm economy in that region. Within a particular region, the level of dependence (or interaction) of specific communities or town on cotton also depends on a number of factors, including the size of the town, its mix of businesses, its social composition and mix of skills, the economic and social history of the town, and the location of towns in the region in relation to each other.

In general, there is a rough hierarchy of towns in any region, and an overlapping set of trade and social catchments for particular goods, services and social amenities. In other words, cotton growers in a region will have trade and social linkages with a wide variety of businesses, social groups, and government services and agencies in a number of towns within the region, as well as linkages with businesses in some of the larger towns outside the region, and possibly no linkages with some of the smaller towns within the region. Thus, there may be some towns within a cotton growing region whose economic and social linkages with the cotton industry are very slight or non-existent.

In turn, the businesses with which growers have trade linkages will themselves have varying levels of trade linkages with other firms within the region, as well as outside it. The more that each firm's inputs are sourced within the region rather than 'imported' from outside it, the greater will be the relative effect of the cotton industry in that region.

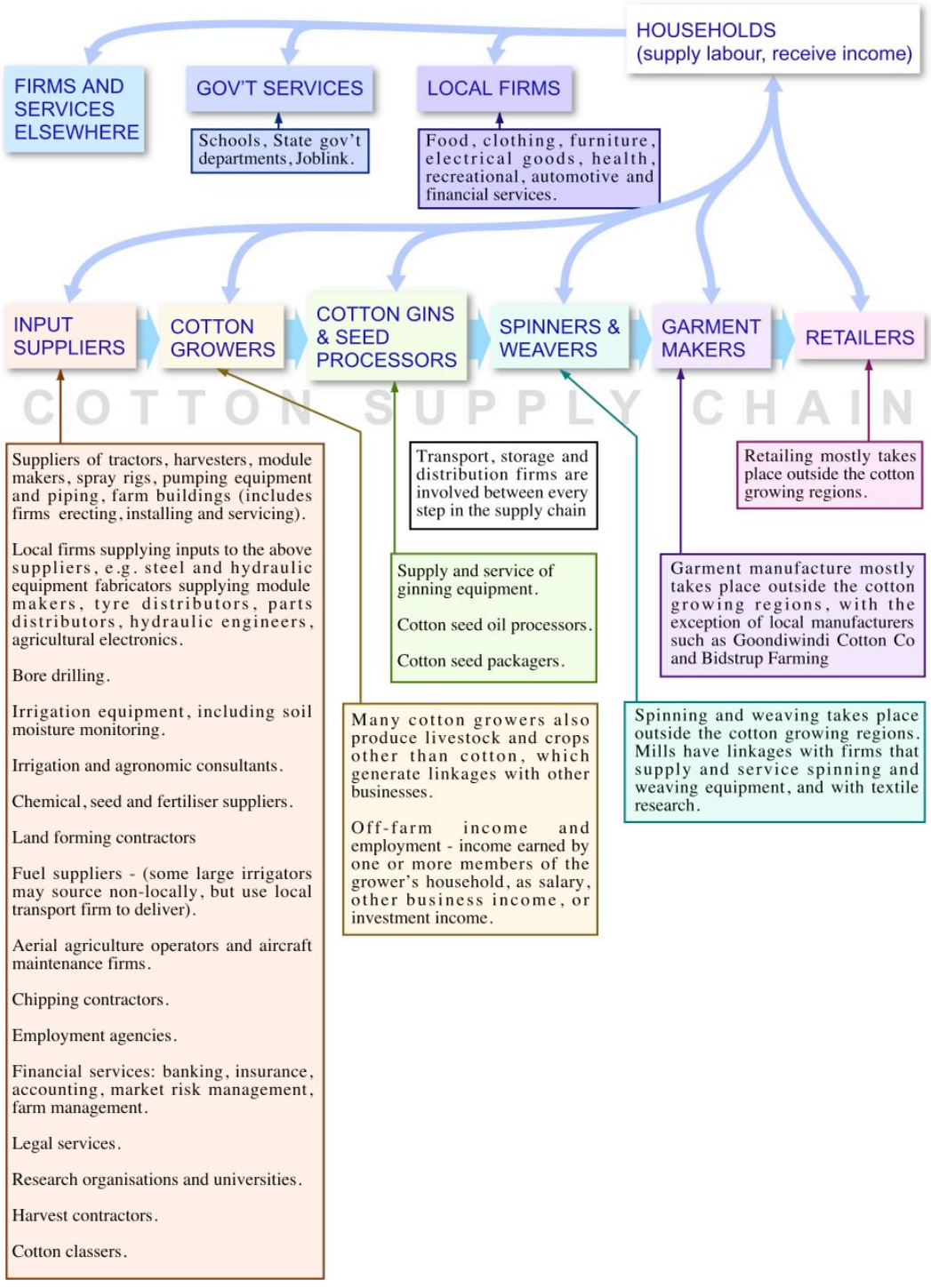
### *3.2.2. Economic linkages*

Figure 3.2.1 is a schematic representation of the economic linkages between the cotton industry and the regional economy, arranged as a 'supply chain' or 'value adding' chain. Cotton production is represented as the second link in this chain. The Figure shows that cotton growers purchase inputs from a wide variety of suppliers. These suppliers will be located in a variety of places, both inside and outside the region. In turn, those suppliers will purchase their inputs from a wide variety of suppliers, inside and outside the region. The link between households and growers (and similarly between households and all other links in the chain) illustrates that one of the most important suppliers of inputs to the industry are 'households', in the sense that residents of local households work in (supply labour to) businesses at all stages of the chain, thus earning income, part of which they in turn spend in local businesses, and also generate demand for local public facilities such as schools, hospitals, and recreational facilities. One important feature of the labour supplied to the cotton industry along this chain, however, is that a significant proportion of it has traditionally been both mobile and seasonal (chippers, harvesters, gin employees). This can increase the 'leakage' from the region of the income these people earn in the local industry. Some of this labour, however, comprises local permanent residents. Other major inputs, such as chemicals, machinery, and fuel, are largely manufactured outside the region (with some exceptions, such as the manufacture of module builders), and the local component of their value is usually relatively low. To the extent, though, that services (agronomists, irrigation consultants, financial and legal advisors, researchers, land-forming contractors and the like) are increasing their role, and to the extent that those providing such services both live locally and tend to spend locally, then the local or regional impact of the industry is increased.

Some local processing of cotton almost always occurs in the form of ginning and cotton seed oil extraction, as well as the manufacture and packing of animal feed based on cotton seed products. Again, the labour for these processes is seasonal, but may be more local than that provided by chippers and harvesters. Other major inputs into the ginning process, such as transport, machinery and fuel, represent mostly leakages from the local economy.

The further processing of cotton beyond the early separation from seed is rare in the cotton growing regions. Approximately six per cent of lint production is spun in Australia, the remainder being exported to overseas mills. In at least two places, however, cotton growers have become involved in the value adding chain beyond the ginning of their cotton, by the manufacture of finished garments. While the spinning and weaving processes occur elsewhere, some local labour is employed in garment making.

Figure 3.2.1 Linkages between the cotton industry and the regional and national economy, and examples of the firms involved in these linkages.




A comprehensive picture of the local and regional linkages of the cotton industry in any particular region would require the collection of 'primary' (new) data from the firms involved at all stages of this chain. This would allow the construction of a detailed 'chain' diagram for a specific region, identifying specific key businesses, their geographic location, and the volume of the trade on each of their linkages. Primary data would also allow the construction of a 'transactions' (or 'input-output') table which displays the dollar values of all the trading relationships in the region for all local

businesses, including those of the cotton industry. This would allow the estimation of the impacts of specific changes in cotton industry activity, on the basis of a number of assumptions. Such a table would require the purchase of data from ABS to enable relevant industries to be studied at a level of disaggregation (for example, cotton ginning, aerial agriculture) that is not possible with published data.

Beyond the explicit trading flows depicted on a chain diagram or transactions table, however, there is another dimension of the interaction between the various players in the cotton industry in a particular region that should be recognised. In some cotton growing regions, there is a concentration of businesses and service agencies involved in the cotton industry that constitutes an 'industry cluster'. The economic performance of these firms is determined not only by the amount of business they do, but by the advantages they reap (called 'agglomeration economies') from operating in close proximity with each other, and through engaging in both formal and informal interactions where information can be efficiently shared, trust and understanding built up, innovation enhanced, and a productive balance between competition and cooperation achieved. The industry in the Namoi Valley, centred on the town of Narrabri, appears to be a good example of this.

### *3.2.3. Knowledge linkages*

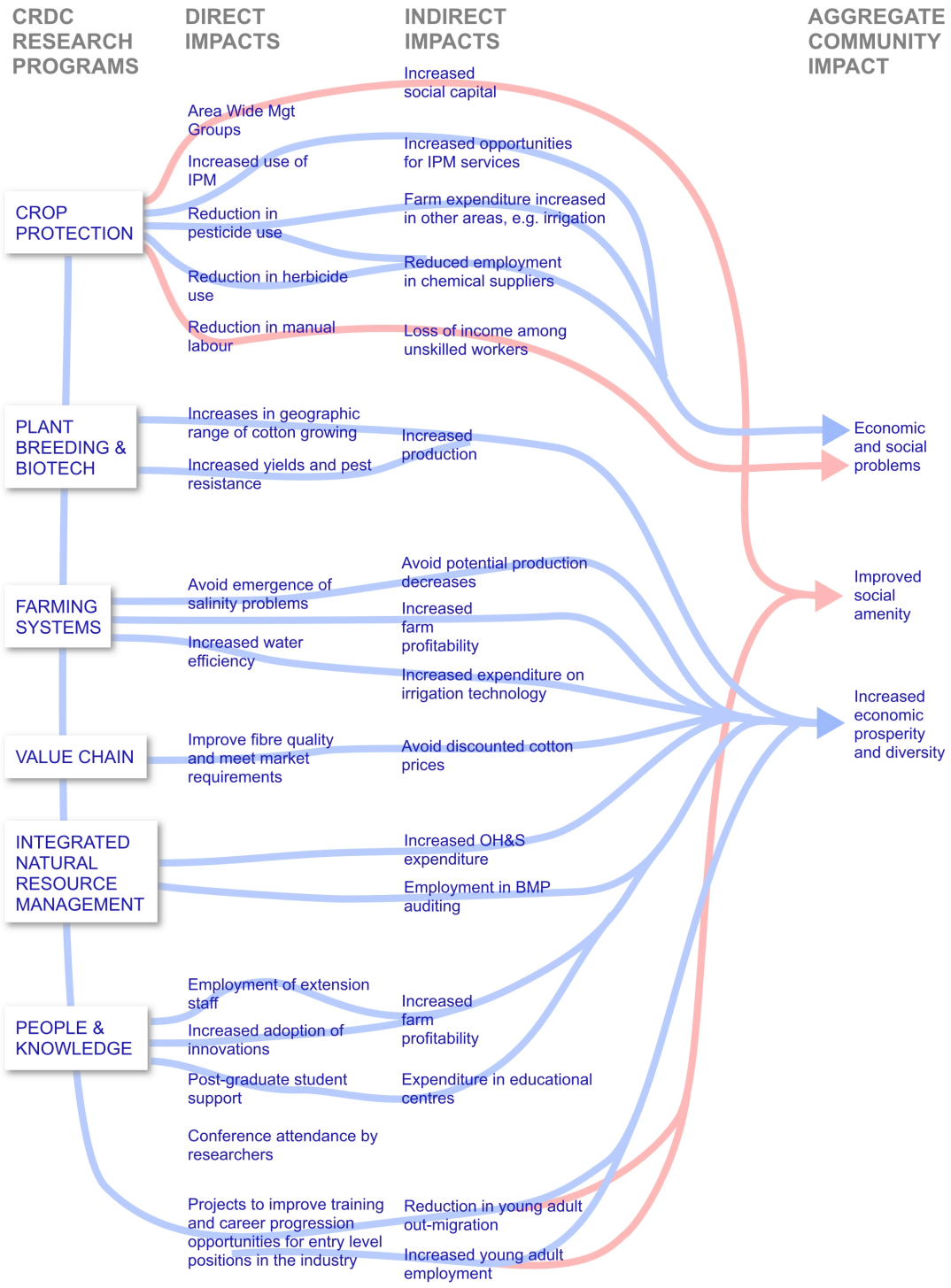
While the above description of the economic linkages between the cotton industry and regional economies could apply to other primary industries, the increasing knowledge intensity of the cotton industry adds another dimension to the relationship between the industry and regional economies. Firstly, the industry makes greater use of agronomic consultants than most other primary industries. The number of consultants has grown significantly in recent years — the membership of Cotton Consultants Australia Inc has increased from 185 in 1996/97 to 317 in 2002/03. Through the professional linkages of the consultants, cotton production responds relatively rapidly to changes in production technology. The professional networks of consultants also facilitate coordinated action among producers, such as has occurred to manage pest resistance and implement Integrated Pest Management.

There is also a significant concentration of cotton research expertise in the Narrabri area, including the Australian Cotton Research Institute, NSW Agriculture, the Australian Cotton Cooperative Research Centre, the CSIRO Cotton Research Unit and the University of Sydney Plant Breeding Institute. These organisations employ growing numbers of professionals and support staff. For example, the CSIRO Cotton Research Unit employed 20 staff in 1990, with an increase to 60 staff in 2002.

The main government funding organisation for cotton research, the Cotton Research and Development Corporation is also located in Narrabri, and is the only such Corporation located in a rural area. The programs of the Cotton Research and Development Corporation, and the public and private sector research facilities in the region generate economic linkages in the region not only through their expenditure on inputs, and the secondary expenditure of staff on locally supplied household goods and services, but also through the spending of those who visit the region to do business with those research organisations. Apart from this contribution to the local economy, there may be other effects within the local community due to the presence of people with higher levels of education and non-rural backgrounds. Such people may have higher expectations of the level of amenity than is normally provided by a country town, and comprise a market for cultural enterprises, such as cinemas, which would not otherwise be viable. Some of the potential linkages between the programs of the Cotton Research and Development Corporation and these socio-economic impacts are illustrated in Figure 3.2.2.

In addition to the effects of cotton research and development in Narrabri, there are also effects in towns outside of the cotton growing regions. Most significant of these is Armidale, where the University of New England is a partner in the Australian Cotton Cooperative Research Centre. A total of 5.2 equivalent full-time staff are employed in cotton-related teaching and research at the University of New England. Across Australia, there are a total of 40.65 such positions associated with the Cotton CRC, including staff at CSIRO Plant Industry, CSIRO Entomology, CSIRO Textile and Fibre Technology, the Northern Territory Department of Business, Industry and Resource Development, the Queensland Department of Primary Industries, New South Wales Agriculture, the University of Queensland, the University of New England and the University of Sydney. There are up to fifteen postgraduate students at any one time studying under the auspices of the Australian Cotton CRC. The cotton industry also provides an important base level entry point for graduates from agricultural and rural science, and agricultural economics degrees pursuing careers in agriculture.

Figure 3.2.2 Potential linkages between the programs of the Cotton Research and Development Corporation and direct, indirect and aggregate community impacts. Most of these linkages involve increased farm profitability and increased productivity or production. Because of lack of space, these farm-specific impacts have only been shown where space permits.



There is also a significant amount of research and development carried out in private sector firms that supply goods and services to the cotton industry, such as irrigation equipment, software, telemetry, chemicals and fertilisers, cotton varieties, and machinery. This research and development may be carried out at locations quite remote from the cotton growing regions, for good economic reasons, but the interaction between these firms and cotton producers is typically quite close, and this may result in some local economic and social impacts.

### 3.2.4. Social linkages

An analysis of the factors that explain the impacts of the industry on the regional community also requires a thorough understanding of the interactions, networks, information flows, and collaboration of a wide range of participants in the industry in a region. The intensity of these interactions, the sense of shared fates, and the accepted reciprocal obligations build what is known as 'social capital' and an attachment to place. These have value as ingredients in the adaptability of the industry in a region to the challenges of change. The forces of structural change in rural communities (described in section 3.1) can have the effect of eroding this social capital, or at least stretching it very thinly over an increasing number of purposes. It is therefore important to have a better understanding of the sources and attributes of this social capital and its role in enhancing the performance of a cotton industry cluster.

### 3.2.5. Spatial Representation of Economic Linkages to the Cotton Industry

Figure 3.2.3 below shows the location of the businesses listed in the Cotton Yearbook 2002 (Dowling, 2002). These businesses were grouped into categories and the locations of the businesses in a number of these categories are shown in Figure 3.2.4 and Figure 3.2.5 below. Maps for categories with relatively few businesses are provided in Appendix 1. The maps are illustrative of how economic linkages can be represented spatially, but do not necessarily include all firms with linkages to the cotton industry.

Figure 3.2.3 Location of all listed businesses supplying the cotton industry.

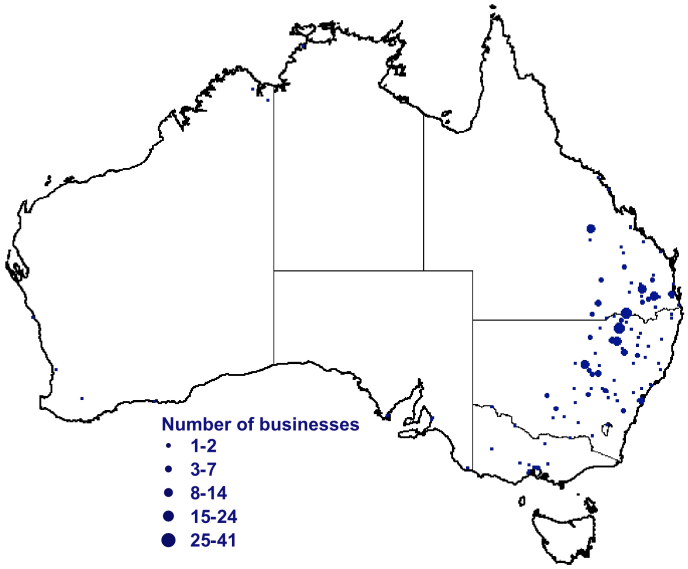


Figure 3.2.4 Location of firms supplying the cotton industry with boom sprays, cotton picker parts, machinery, tarpaulins, engines, hydraulics, irrigation equipment, irrigation metering, pipes, spray equipment, pumps and earthmoving services and machinery.

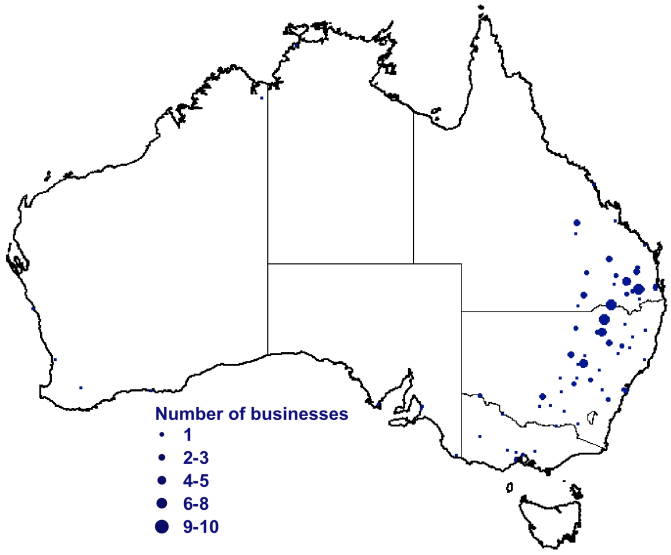
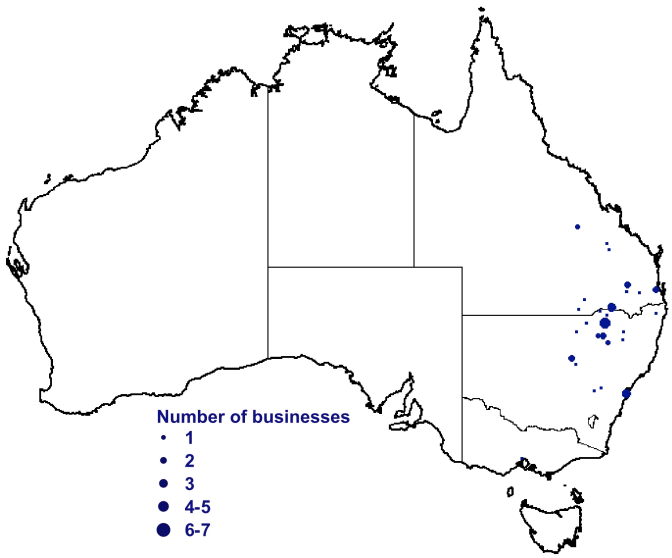



Figure 3.2.5 Location of ginning and marketing, ginning, ginning equipment and cotton classing firms.



The preceding maps are illustrative of how a more comprehensive study might examine the spatial disposition of the linkages between the cotton industry and various service industries. While accepting the limitations imposed by the source of data used to compile the above maps (possibly not representative of all firms in the cotton supply chain), there are some plausible patterns shown in the maps. The number of locations in each category reflects factors such as the costs and benefits of proximity to production areas, economies of size in the provision of particular goods and services, and costs of transport and communication. For example, Figure 3.2.4 reflects the wide range of goods included in this category, the specialised nature of many of the items included in it (which require specialised firms to supply them), the importance of immediate delivery from local inventories of timing-critical equipment, and the importance of local personalised service to the cotton producer.

### *3.2.6. Geographic Distribution of Cotton Research and Education*

The maps below show the numbers of research projects funded by the Cotton Research and Development Corporation in localities across Australia, and the numbers of post-graduate students.

Figure 3.2.6 Location of research projects funded by the Cotton Research and Development Corporation in 1998.

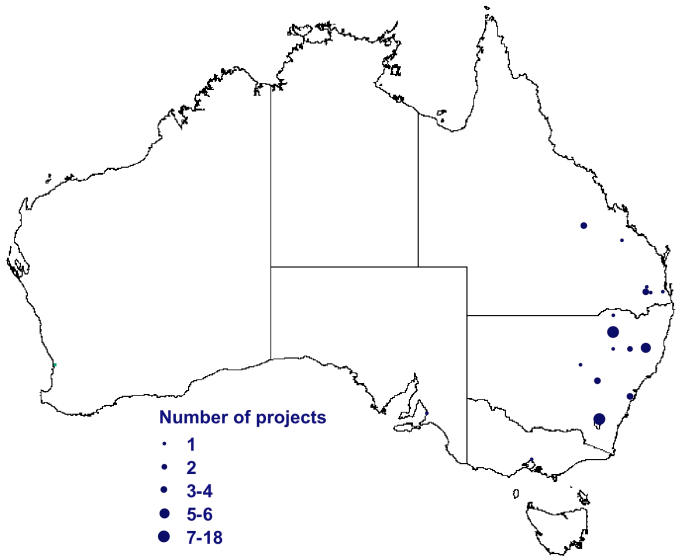


Figure 3.2.7 Location of research projects funded by the Cotton Research and Development Corporation in 2002.

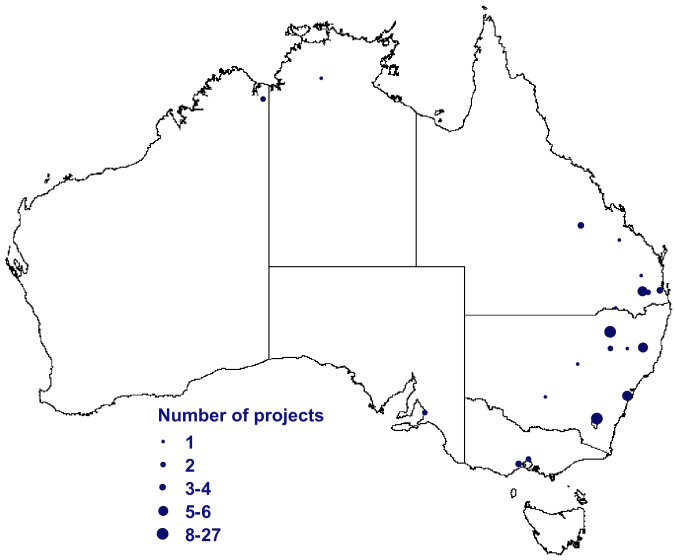
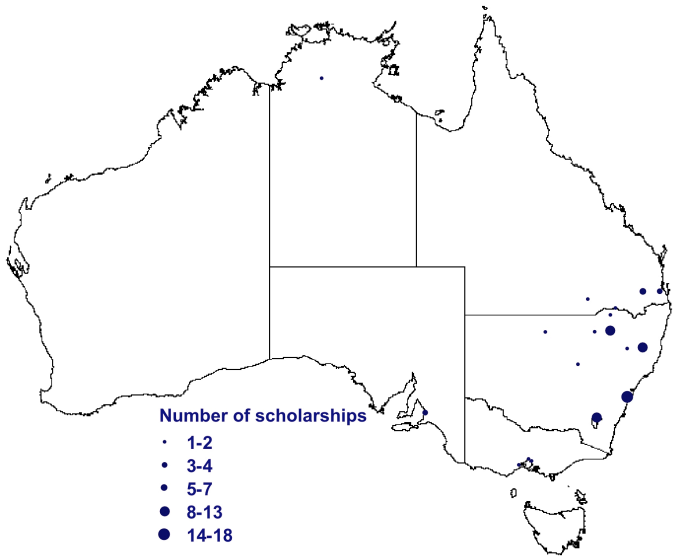



Figure 3.2.8 Location of recipients of postgraduate scholarships funded by the Cotton Research and Development Corporation between 1990 and 2002.



## 3.3. Community Profiles for the Australian Cotton Growing Regions

### *3.3.1. Introduction*

The LGAs that cover each of the cotton growing regions, and the towns within, or close to these regions, are listed in Table 3.3.1. The tables in sections 3.3.2 to 3.3.12, below, present a range of social and economic indicators for these regions. The Lower Darling, which contains only one cotton farm whose impact on the whole of the Unincorporated Far West would be minimal has been omitted. The figures are derived from Australian Bureau of Statistics (ABS) Census data for the years 1991, 1996 and 2001, published by ABS in its Basic Community Profiles. This data is available for both local government areas (LGAs) and towns. Because the 2001 Census is the most recent data available, a number of small cotton growing areas that have commenced in the last few years have been omitted.

Table 3.3.1 Listing of LGAs that cover the cotton growing regions, and the towns within, or close to these regions.

| Cotton Growing Region | LGAs | Towns |
|---|---|---|
| Central Highlands | Emerald, Peak Downs | Emerald |
| Dawson – Callide | Banana | Theodore, Biloela, Moura |
| St George – Dirranbandi | Balonne | St George, Dirranbandi |
| Darling Downs | Wambo, Dalby, Jondaryan, Chinchilla, Pittsworth, Milmerran | Dalby, Chinchilla, Oakey, Pittsworth, Milmerran, Toowoomba |
| Macintyre Valley(a) | Waggamba (Qld), Moree Plains (NSW) | Goondiwindi, Mungindi, Bogabilla |
| Gwydir Valley | Moree Plains, Walgett | Moree, Collarenebri |
| Upper Namoi | Gunnedah | Gunnedah, Boggabri, Curlewis |
| Lower Namoi | Narrabri, Warren | Narrabri, Wee Waa, Walgett |
| Macquarie Valley | Narromine, Warren | Narromine, Warren, Trangie, Dubbo |
| Bourke | Bourke | Bourke |
| Lachlan — Murrumbidgee | Carathool, Lachlan | Hillston, Lake Cargellico, Griffith |

(a) Approximately 40 per cent of cotton production in the Macintyre Valley is in Queensland, and 60 per cent in New South Wales.

### 3.3.2. Central Highlands

Table 3.3.2 Basic socio-economic profile indicators for the Central Highlands cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | **Emerald** | **Peak Downs** |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 37.5 | -(a) |
| Population 1991 | 10,663 | 3,959 |
| Population 1996 | 13,312 | 3,172 |
| Population 2001 | 14,249 | 3,299 |
| % change 1991-1996 | 24.8 | -19.9 |
| % change 1996-2001 | 7.0 | 4.0 |
| *Demographics* | | |
| % aged 14 and below | 23.0 | 26.7 |
| % 15-64 | 68.4 | 68.4 |
| % 65 + | 8.6 | 4.9 |
| Dependency ratio (b) | 46.2 | 46.2 |
| % Aboriginal or TSI | 2.5 | 1.9 |
| *Labour force* | | |
| Unemployment rate (%) | 5.3 | 3.0 |
| Unemployment rate 15-19 (%) | 10.5 | 9.8 |
| Unemployment rate males 20-44 (%) | 4.5 | 1.8 |
| Participation rate | 69.1 | 75.1 |
| % labourer and related workers | 12.0 | 8.3 |
| % employed in agriculture, forestry and fishing | 13.7 | 17.7 |
| *Education* | | |
| % left school year 10 or less (c) | 51.0 | 48.3 |
| % left school year 9 or less (c) | 18.8 | 14.1 |
| % with no qualifications | 57.9 | 53.9 |
| *Social* | | |
| % families with weekly income <$300 | 2.9 | 2.8 |
| % rental housing | 34.4 | 51.6 |
| % fully owned housing | 32.0 | 28.0 |
| % households with no vehicle | 5.8 | 2.7 |
| % separated or divorced | 10.9 | 7.8 |
| % single parent families | 10.5 | 6.1 |
| | **Towns** | |
| | **Emerald** | |
| Population 1991 | 6,557 | |
| Population 1996 | 9,345 | |
| Population 2001 | 10,092 | |
| % change 1991-1996 | 42.5 | |
| % change 1996-2001 | 8.0 | |

(a) According to the 1997 ABS Agricultural Census, no cotton was grown in Peak Downs Shire
(b) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(c) Includes those who never went to school.

### 3.3.3. Dawson – Callide

Table 3.3.3 Basic socio-economic profile indicators for the Dawson – Callide cotton growing region.

| Profile Indicators | LGA | | |
|---|---|---|---|
| | Banana | | |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 22.2 | | |
| Population 1991 | 14,257 | | |
| Population 1996 | 13,598 | | |
| Population 2001 | 13,489 | | |
| % change 1991-1996 | -4.6 | | |
| % change 1996-2001 | -0.8 | | |
| *Demographics* | | | |
| % aged 14 and below | 24.2 | | |
| % 15-64 | 66.2 | | |
| % 65 + | 9.5 | | |
| Dependency ratio (a) | 51.1 | | |
| % Aboriginal or TSI | 2.8 | | |
| *Labour force* | | | |
| Unemployment rate (%) | 5.0 | | |
| Unemployment rate 15-19 (%) | 10.5 | | |
| Unemployment rate males 20-44 (%) | 5.2 | | |
| Participation rate | 71.7 | | |
| % labourer and related workers | 14.7 | | |
| % employed in agriculture, forestry and fishing | 20.8 | | |
| *Education* | | | |
| % left school year 10 or less (b) | 55.2 | | |
| % left school year 9 or less (b) | 22.6 | | |
| % with no qualifications | 63.3 | | |
| *Social* | | | |
| % families with weekly income <$300 | 4.5 | | |
| % rental housing | 27.5 | | |
| % fully owned housing | 41.7 | | |
| % households with no vehicle | 6.2 | | |
| % separated or divorced | 8.6 | | |
| % single parent families | 10.7 | | |
| | Towns | | |
| | Theodore | Biloela | Moura |
| Population 1991 | 502 | 5,051 | 2,367 |
| Population 1996 | 508 | 5,161 | 1,980 |
| Population 2001 | 450 | 5,485 | 1,802 |
| % change 1991-1996 | 1.2 | 2.2 | -16.3 |
| % change 1996-2001 | -11.4 | 6.3 | -9.0 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.4. St George — Dirranbandi

Table 3.3.4 Basic socio-economic profile indicators for the St George — Dirranbandi cotton growing region.

| Profile Indicators | LGA | |
|---|---|---|
| | Balonne | |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 53.1 | |
| Population 1991 | 5,112 | |
| Population 1996 | 4,846 | |
| Population 2001 | 5,420 | |
| % change 1991-1996 | -5.2 | |
| % change 1996-2001 | 11.8 | |
| *Demographics* | | |
| % aged 14 and below | 24.5 | |
| % 15-64 | 67.0 | |
| % 65 + | 8.5 | |
| Dependency ratio (a) | 49.1 | |
| % Aboriginal or TSI | 13.5 | |
| *Labour force* | | |
| Unemployment rate (%) | 3.7 | |
| Unemployment rate 15-19 (%) | 7.5 | |
| Unemployment rate males 20-44 (%) | 3.5 | |
| Participation rate | 74.1 | |
| % labourer and related workers | 17.3 | |
| % employed in agriculture, forestry and fishing | 37.6 | |
| *Education* | | |
| % left school year 10 or less (b) | 53.2 | |
| % left school year 9 or less (b) | 21.6 | |
| % with no qualifications | 65.0 | |
| *Social* | | |
| % families with weekly income <$300 | 4.2 | |
| % rental housing | 28.7 | |
| % fully owned housing | 37.3 | |
| % households with no vehicle | 6.6 | |
| % separated or divorced | 9.2 | |
| % single parent families | 9.9 | |
| | Towns | |
| | St George | Dirranbandi |
| Population 1991 | 2,512 | 460 |
| Population 1996 | 2,463 | 401 |
| Population 2001 | 2,781 | 526 |
| % change 1991-1996 | -2.0 | -12.8 |
| % change 1996-2001 | 12.9 | 31.2 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.5. Darling Downs

Table 3.3.5 Basic socio-economic profile indicators for the Darling Downs cotton growing region.

| Profile Indicators | LGAs | | | | | |
|---|---|---|---|---|---|---|
| | Wambo | Dalby | Jondaryan | Chinchilla | Pittsworth | Milmerran |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 29.0 | 49.4 | 27.3 | 8.0 | 44.2 | 35.8 |
| Population 1991 | 5,184 | 9,385 | 6,796 | 5,406 | 4,035 | 3,014 |
| Population 1996 | 5,205 | 9,517 | 6,508 | 5,600 | 4,264 | 2,830 |
| Population 2001 | 5,102 | 9,731 | 6,906 | 5,626 | 4,445 | 3,935 |
| % change 1991-1996 | 0.4 | 1.4 | -4.2 | 3.6 | 5.7 | -6.1 |
| % change 1996-2001 | -2.0 | 2.2 | 6.1 | 0.5 | 4.2 | 39.0 |
| *Demographics* | | | | | | |
| % aged 14 and below | 24.9 | 23.7 | 25.3 | 24.4 | 26.5 | 19.2 |
| % 15-64 | 63.7 | 63.3 | 64.4 | 61.3 | 61.0 | 72.2 |
| % 65 + | 11.4 | 13.0 | 10.4 | 14.3 | 12.5 | 8.6 |
| Dependency ratio (a) | 57.0 | 57.9 | 55.4 | 63.2 | 63.8 | 38.5 |
| % Aboriginal or TSI | 2.2 | 5.6 | 5.3 | 2.6 | 1.3 | 2.2 |
| *Labour force* | | | | | | |
| Unemployment rate (%) | 5.1 | 6.9 | 5.7 | 7.5 | 3.1 | 2.6 |
| Unemployment rate 15-19 (%) | 17.9 | 12.9 | 12.4 | 13.4 | 8.4 | 12.2 |
| Unemployment rate males 20-44 (%) | 6.2 | 7.8 | 5.8 | 9.4 | 2.2 | 1.5 |
| Participation rate | 68.4 | 64.2 | 64.2 | 61.5 | 67.5 | 78.2 |
| % labourer and related workers | 10.7 | 10.5 | 20.1 | 10.3 | 18.7 | 16.5 |
| % employed in agriculture, forestry and fishing | 49.1 | 8.1 | 24.0 | 27.4 | 29.4 | 23.9 |
| *Education* | | | | | | |
| % left school year 10 or less (b) | 60.8 | 54.8 | 58.3 | 60.2 | 60.4 | 60.1 |
| % left school year 9 or less (b) | 24.9 | 22.7 | 24.6 | 27.2 | 24.1 | 20.4 |
| % with no qualifications | 71.5 | 64.0 | 66.0 | 68.2 | 68.4 | 55.3 |
| *Social* | | | | | | |
| % families with weekly income <$300 | 7.8 | 2.8 | 5.3 | 6.0 | 3.1 | 4.4 |
| % rental housing | 15.2 | 29.9 | 25.8 | 21.8 | 21.6 | 26.4 |
| % fully owned housing | 54.8 | 38.9 | 41.3 | 51.4 | 47.9 | 43.6 |
| % households with no vehicle | 3.2 | 9.6 | 5.2 | 8.6 | 4.5 | 6.0 |
| % separated or divorced | 8.2 | 8.8 | 9.2 | 8.9 | 6.8 | 11.0 |
| % single parent families | 7.8 | 15.0 | 12.3 | 12.1 | 8.1 | 7.8 |

| | Towns | | | | | |
|---|---|---|---|---|---|---|
| | Dalby | Chinchilla | Oakey | Pittsworth | Milmerran | Toowoomba |
| Population 1991 | 9,385 | 3,152 | 3,425 | 2,110 | 1,159 | 75,990 |
| Population 1996 | 9,517 | 3,247 | 3,396 | 2,323 | 1,054 | 83,350 |
| Population 2001 | 9,731 | 3,376 | 3,469 | 2,339 | 1,250 | 89,338 |
| % change 1991-1996 | 1.4 | 3.0 | -0.8 | 10.1 | -9.1 | 9.7 |
| % change 1996-2001 | 2.2 | 4.0 | 2.1 | 0.7 | 18.6 | 7.2 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.6. Macintyre Valley

Table 3.3.6 Basic socio-economic profile indicators for the Macintyre Valley cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | **Waggamba (Qld)** | **Moree Plains (NSW)** |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 30.0 | 55.4 |
| Population 1991 | 2,898 | 16,918 |
| Population 1996 | 2,712 | 15,517 |
| Population 2001 | 2,975 | 15,737 |
| % change 1991-1996 | -6.4 | -8.3 |
| % change 1996-2001 | 9.7 | 1.4 |
| *Demographics* | | |
| % aged 14 and below | 24.7 | 24.3 |
| % 15-64 | 67.1 | 66.6 |
| % 65 + | 8.2 | 9.1 |
| Dependency ratio (a) | 49.0 | 50.2 |
| % Aboriginal or TSI | 1.7 | 17.8 |
| *Labour force* | | |
| Unemployment rate (%) | 3.8 | 9.3 |
| Unemployment rate 15-19 (%) | 9.7 | 17.9 |
| Unemployment rate males 20-44 (%) | 3.4 | 11.1 |
| Participation rate | 75.1 | 68.5 |
| % labourer and related workers | 14.0 | 13.1 |
| % employed in agriculture, forestry and fishing | 55.4 | 28.1 |
| *Education* | | |
| % left school year 10 or less (b) | 49.8 | 54.8 |
| % left school year 9 or less (b) | 18.4 | 23.5 |
| % with no qualifications | 63.7 | 60.7 |
| *Social* | | |
| % families with weekly income <$300 | 7.2 | 5.4 |
| % rental housing | 12.9 | 34.8 |
| % fully owned housing | 47.2 | 33.3 |
| % households with no vehicle | 3.1 | 11.5 |
| % separated or divorced | 7.2 | 9.9 |
| % single parent families | 4.9 | 16.1 |
| | **Towns** | |
| | **Goondiwindi** | **Mungindi** | **Boggabilla** |
| Population 1991 | 4,331 | 660 | 751 |
| Population 1996 | 4,374 | 648 | 639 |
| Population 2001 | 5,491 | 645 | 667 |
| % change 1991-1996 | 1.0 | -1.8 | -14.9 |
| % change 1996-2001 | 25.5 | -0.5 | 4.4 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.7. Gwydir Valley

Table 3.3.7 Basic socio-economic profile indicators for the Gwydir Valley cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | Moree Plains | Walgett |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 55.4 | 28.6 |
| Population 1991 | 16,918 | 8,194 |
| Population 1996 | 15,517 | 8,550 |
| Population 2001 | 15,737 | 8,310 |
| % change 1991-1996 | -8.3 | 4.3 |
| % change 1996-2001 | 1.4 | -2.8 |
| *Demographics* | | |
| % aged 14 and below | 24.3 | 21.2 |
| % 15-64 | 66.6 | 67.4 |
| % 65 + | 9.1 | 11.3 |
| Dependency ratio (a) | 50.2 | 48.3 |
| % Aboriginal or TSI | 17.8 | 21.4 |
| *Labour force* | | |
| Unemployment rate (%) | 9.3 | 12.9 |
| Unemployment rate 15-19 (%) | 17.9 | 20.6 |
| Unemployment rate males 20-44 (%) | 11.1 | 17.7 |
| Participation rate | 68.5 | 58.5 |
| % labourer and related workers | 13.1 | 14.5 |
| % employed in agriculture, forestry and fishing | 28.1 | 27.7 |
| *Education* | | |
| % left school year 10 or less (b) | 54.8 | 55.3 |
| % left school year 9 or less (b) | 23.5 | 27.2 |
| % with no qualifications | 60.7 | 60.1 |
| *Social* | | |
| % families with weekly income <$300 | 5.4 | 7.2 |
| % rental housing | 34.8 | 24.3 |
| % fully owned housing | 33.3 | 44.6 |
| % households with no vehicle | 11.5 | 12.3 |
| % separated or divorced | 9.9 | 15.2 |
| % single parent families | 16.1 | 17.4 |
| | **Towns** | |
| | **Moree** | **Collarenebri** |
| Population 1991 | 10,062 | 617 |
| Population 1996 | 9,270 | 544 |
| Population 2001 | 9,273 | 505 |
| % change 1991-1996 | -7.9 | -11.8 |
| % change 1996-2001 | 0.0 | -7.2 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.8. Upper Namoi

Table 3.3.8 Basic socio-economic profile indicators for the Upper Namoi cotton growing region.

| Profile Indicators | LGA | | |
|---|---|---|---|
| | Gunnedah | | |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 33.3 | | |
| Population 1991 | 13,331 | | |
| Population 1996 | 12,819 | | |
| Population 2001 | 11,993 | | |
| % change 1991-1996 | -3.8 | | |
| % change 1996-2001 | -6.4 | | |
| *Demographics* | | | |
| % aged 14 and below | 24.2 | | |
| % 15-64 | 61.0 | | |
| % 65 + | 14.8 | | |
| Dependency ratio (a) | 63.8 | | |
| % Aboriginal or TSI | 10.0 | | |
| *Labour force* | | | |
| Unemployment rate (%) | 9.3 | | |
| Unemployment rate 15-19 (%) | 17.2 | | |
| Unemployment rate males 20-44 (%) | 11.4 | | |
| Participation rate | 59.1 | | |
| % labourer and related workers | 11.6 | | |
| % employed in agriculture, forestry and fishing | 21.0 | | |
| *Education* | | | |
| % left school year 10 or less (b) | 62.5 | | |
| % left school year 9 or less (b) | 27.2 | | |
| % with no qualifications | 61.6 | | |
| *Social* | | | |
| % families with weekly income <$300 | 6.0 | | |
| % rental housing | 24.9 | | |
| % fully owned housing | 46.0 | | |
| % households with no vehicle | 9.2 | | |
| % separated or divorced | 9.1 | | |
| % single parent families | 15.8 | | |
| | Towns | | |
| | Gunnedah | Boggabri | Curlewis |
| Population 1991 | 8,874 | 958 | 651 |
| Population 1996 | 8,315 | 875 | 613 |
| Population 2001 | 7,871 | 803 | 575 |
| % change 1991-1996 | -6.3 | -8.7 | -5.8 |
| % change 1996-2001 | -5.3 | -8.2 | -6.2 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.9. Lower Namoi

Table 3.3.9 Basic socio-economic profile indicators for the Lower Namoi cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | Narrabri | Walgett |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 60.2 | 28.6 |
| Population 1991 | 14,653 | 8,194 |
| Population 1996 | 14,101 | 8,550 |
| Population 2001 | 13,817 | 8,310 |
| % change 1991-1996 | -3.8 | 4.3 |
| % change 1996-2001 | -2.0 | -2.8 |
| *Demographics* | | |
| % aged 14 and below | 23.3 | 21.2 |
| % 15-64 | 64.3 | 67.4 |
| % 65 + | 12.4 | 11.3 |
| Dependency ratio (a) | 55.4 | 48.3 |
| % Aboriginal or TSI | 7.8 | 21.4 |
| *Labour force* | | |
| Unemployment rate (%) | 8.1 | 12.9 |
| Unemployment rate 15-19 (%) | 17.5 | 20.6 |
| Unemployment rate males 20-44 (%) | 10.2 | 17.7 |
| Participation rate | 65.3 | 58.5 |
| % labourer and related workers | 11.4 | 14.5 |
| % employed in agriculture, forestry and fishing | 25.4 | 27.7 |
| *Education* | | |
| % left school year 10 or less (b) | 59.6 | 55.3 |
| % left school year 9 or less (b) | 25.3 | 27.2 |
| % with no qualifications | 62.7 | 60.1 |
| *Social* | | |
| % families with weekly income <$300 | 5.1 | 7.2 |
| % rental housing | 27.8 | 24.3 |
| % fully owned housing | 41.7 | 44.6 |
| % households with no vehicle | 8.6 | 12.3 |
| % separated or divorced | 9.3 | 15.2 |
| % single parent families | 13.8 | 17.4 |

| | Towns | | |
|---|---|---|---|
| | Narrabri | Wee Waa | Walgett |
| Population 1991 | 6,694 | 2,030 | 2,091 |
| Population 1996 | 6,419 | 1,860 | 1,970 |
| Population 2001 | 6,245 | 1,816 | 1,826 |
| % change 1991-1996 | -4.1 | -8.4 | -5.8 |
| % change 1996-2001 | -2.7 | -2.4 | -7.3 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.10. Macquarie Valley

Table 3.3.10 Basic socio-economic profile indicators for the Macquarie Valley cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | Narromine | Warren |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 26.1 | 49.7 |
| Population 1991 | 6,697 | 3,595 |
| Population 1996 | 6,523 | 3,290 |
| Population 2001 | 6,621 | 3,155 |
| % change 1991-1996 | -2.6 | -8.5 |
| % change 1996-2001 | 1.5 | -4.1 |
| *Demographics* | | |
| % aged 14 and below | 24.6 | 23.1 |
| % 15-64 | 62.5 | 65.8 |
| % 65 + | 12.9 | 11.1 |
| Dependency ratio (a) | 60.0 | 51.9 |
| % Aboriginal or TSI | 14.5 | 11.8 |
| *Labour force* | | |
| Unemployment rate (%) | 8.5 | 7.2 |
| Unemployment rate 15-19 (%) | 26.7 | 14.5 |
| Unemployment rate males 20-44 (%) | 9.0 | 7.7 |
| Participation rate | 62.7 | 69.8 |
| % labourer and related workers | 13.9 | 15.6 |
| % employed in agriculture, forestry and fishing | 34.0 | 45.0 |
| *Education* | | |
| % left school year 10 or less (b) | 58.2 | 56.9 |
| % left school year 9 or less (b) | 24.8 | 23.7 |
| % with no qualifications | 63.9 | 65.9 |
| *Social* | | |
| % families with weekly income <$300 | 5.2 | 4.9 |
| % rental housing | 25.8 | 28.6 |
| % fully owned housing | 44.2 | 43.0 |
| % households with no vehicle | 9.2 | 9.2 |
| % separated or divorced | 11.1 | 8.9 |
| % single parent families | 15.6 | 12.4 |

| | Towns | | | |
|---|---|---|---|---|
| | Narromine | Warren | Trangie | Dubbo |
| Population 1991 | 3,378 | 2,036 | 991 | 28,064 |
| Population 1996 | 3,486 | 1,909 | 951 | 30,102 |
| Population 2001 | 3,548 | 1,786 | 940 | 30,937 |
| % change 1991-1996 | 3.2 | -6.2 | -4.0 | 7.3 |
| % change 1996-2001 | 1.8 | -6.4 | -1.2 | 2.8 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.11. Bourke

Table 3.3.11 Basic socio-economic profile indicators for the Bourke cotton growing region.

| Profile Indicators | LGA |
|---|---|
| | **Bourke** |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 66.4 |
| Population 1991 | 4,464 |
| Population 1996 | 4,049 |
| Population 2001 | 3,908 |
| % change 1991-1996 | -9.3 |
| % change 1996-2001 | -3.5 |
| *Demographics* | |
| % aged 14 and below | 26.7 |
| % 15-64 | 63.4 |
| % 65 + | 10.0 |
| Dependency ratio (a) | 57.8 |
| % Aboriginal or TSI | 24.5 |
| *Labour force* | |
| Unemployment rate (%) | 6.4 |
| Unemployment rate 15-19 (%) | 11.7 |
| Unemployment rate males 20-44 (%) | 6.3 |
| Participation rate | 66.7 |
| % labourer and related workers | 14.3 |
| % employed in agriculture, forestry and fishing | 27.2 |
| *Education* | |
| % left school year 10 or less (b) | 55.8 |
| % left school year 9 or less (b) | 29.3 |
| % with no qualifications | 59.4 |
| *Social* | |
| % families with weekly income <$300 | 6.7 |
| % rental housing | 32.6 |
| % fully owned housing | 35.9 |
| % households with no vehicle | 14.8 |
| % separated or divorced | 8.3 |
| % single parent families | 18.0 |
| | **Towns** |
| | **Bourke** |
| Population 1991 | 2,976 |
| Population 1996 | 2,775 |
| Population 2001 | 2,562 |
| % change 1991-1996 | -6.8 |
| % change 1996-2001 | -7.7 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### 3.3.12. Southern

Table 3.3.12 Basic socio-economic profile indicators for the Southern cotton growing region.

| Profile Indicators | LGAs | |
|---|---|---|
| | Carathool | Lachlan |
| Value of cotton prod'n as % of agricultural prod'n, 1997 | 0.6 | -(a) |
| Population 1991 | 3,239 | 7,694 |
| Population 1996 | 3,164 | 7,433 |
| Population 2001 | 3,320 | 7,188 |
| % change 1991-1996 | -2.3 | -3.4 |
| % change 1996-2001 | 4.9 | -3.3 |
| *Demographics* | | |
| % aged 14 and below | 23.0 | 24.2 |
| % 15-64 | 65.9 | 61.1 |
| % 65 + | 11.1 | 14.7 |
| Dependency ratio (b) | 51.7 | 63.6 |
| % Aboriginal or TSI | 5.0 | 12.5 |
| *Labour force* | | |
| Unemployment rate (%) | 3.1 | 7.4 |
| Unemployment rate 15-19 (%) | 11.1 | 20.7 |
| Unemployment rate males 20-44 (%) | 3.6 | 9.5 |
| Participation rate | 72.1 | 63.2 |
| % labourer and related workers | 19.6 | 11.2 |
| % employed in agriculture, forestry and fishing | 54.2 | 38.3 |
| *Education* | | |
| % left school year 10 or less (c) | 59.4 | 60.0 |
| % left school year 9 or less (c) | 26.5 | 26.7 |
| % with no qualifications | 65.2 | 64.5 |
| *Social* | | |
| % families with weekly income <$300 | 3.6 | 5.7 |
| % rental housing | 20.4 | 23.1 |
| % fully owned housing | 47.2 | 50.2 |
| % households with no vehicle | 5.9 | 9.0 |
| % separated or divorced | 8.0 | 8.2 |
| % single parent families | 9.5 | 14.1 |
| | Towns | |
| | Hillston | Lake Cargellico |
| Population 1991 | 1,030 | 1,256 |
| Population 1996 | 1,099 | 1,218 |
| Population 2001 | 1,217 | 1,204 |
| % change 1991-1996 | 6.7 | -3.0 |
| % change 1996-2001 | 10.7 | -1.1 |

(a) According to the 1997 ABS Agricultural Census, no cotton was grown in Peak Downs Shire
(b) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(c) Includes those who never went to school.

### 3.3.13. Comparative figures for Queensland, New South Wales and Australia

Table 3.3.13 Basic socio-economic profile indicators for Queensland, New South Wales and Australia for comparison with the indicators in the previous tables.

| Profile Indicators | Area of Australia | | |
|---|---|---|---|
| | Queensland | New South Wales | Australia |
| Population 1991 | 2,977,810 | 5,732,032 | 16,850,334 |
| Population 1996 | 3,368,850 | 6,038,696 | 17,892,423 |
| Population 2001 | 3,655,139 | 6,371,745 | 18,972,350 |
| % change 1991-1996 | 13.1 | 5.4 | 6.2 |
| % change 1996-2001 | 8.5 | 5.5 | 6.0 |
| *Demographics* | | | |
| % aged 14 and below | 21.1 | 20.7 | 20.7 |
| % 15-64 | 66.6 | 66.2 | 66.7 |
| % 65 + | 12.3 | 13.1 | 12.6 |
| Dependency ratio (a) | 50.2 | 51.0 | 50.0 |
| % Aboriginal or TSI | 3.1 | 1.9 | 2.2 |
| *Labour force* | | | |
| Unemployment rate (%) | 8.2 | 7.2 | 7.4 |
| Unemployment rate 15-19 (%) | 18.0 | 16.2 | 16.7 |
| Unemployment rate males 20-44 (%) | 8.9 | 8.0 | 8.1 |
| Participation rate | 63.1 | 62.2 | 63.0 |
| % labourer and related workers | 9.7 | 8.0 | 8.6 |
| % employed in agriculture, forestry and fishing | 4.9 | 3.4 | 4.0 |
| *Education* | | | |
| % left school year 10 or less (b) | 45.4 | 45.0 | 41.6 |
| % left school year 9 or less (b) | 17.0 | 18.2 | 17.8 |
| % with no qualifications | 56.8 | 51.5 | 53.8 |
| *Social* | | | |
| % families with weekly income <$300 | 3.5 | 3.5 | 3.5 |
| % rental housing | 30.1 | 27.5 | 26.3 |
| % fully owned housing | 36.6 | 41.1 | 39.7 |
| % households with no vehicle | 9.3 | 12.0 | 10.0 |
| % separated or divorced | 11.6 | 10.5 | 10.8 |
| % single parent families | 16.0 | 15.5 | 15.4 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

### COMMUNITY PROFILES: KEY POINTS

The preceding profiles provide a number of insights about the relationships between the cotton industry and the communities in which it is located.

- The broad pattern of population growth and decline in towns in regional Australia is not, perhaps with one or two exceptions, greatly affected by the presence of the cotton industry in a region. For example, LGAs in the vicinity of 'sponge cities' such as Toowoomba are experiencing population growth (Jondaryan and Milmerran), while more remote LGAs are experiencing population loss (Bourke). Bourke is losing population despite the fact that cotton is the major contributor to the value of agricultural production in Bourke. Jondaryan and Milmerran are gaining population even though cotton makes a relatively smaller contribution to the value of agricultural production in these two LGAs.
- Most of the LGAs in the cotton growing regions have unemployment rates lower than State or national averages. However, several LGAs in the regions with a relatively long history of cotton production have higher unemployment rates. This applies to both the overall unemployment rate and the rate among young males.
- Almost all the LGAs in the cotton growing regions have levels of education that are lower than the State and national averages.
- The majority of LGAs have higher proportions of low income families than the State or national average.
- With the exception of those LGAs with relative high proportions of Aboriginal people, most LGAs have lower proportions of households with no vehicles than the State or national average.
- Also with the exception of those LGAs with relative high proportions of Aboriginal people, most LGAs in the cotton growing regions have lower proportions of single parent families than the State or national average.

## 3.4. Namoi and Gwydir Case Studies

In this section, we take a closer look at two of the major cotton producing regions, the Namoi and the Gwydir Valleys in northern New South Wales. For the purposes of this discussion, we will assume that the economic and social catchments of the cotton growing areas of the Namoi Valley are equivalent to the Shires of Gunnedah, Narrabri and Walgett, while the Gwydir Valley cotton region is equivalent to Moree Plains Shire. In fact, Moree Plains Shire extends to the Queensland border (the Macintyre River) and therefore overlaps into the Macintyre Valley cotton-growing region. Approximately 60 per cent of the cotton grown in the latter region is grown within Moree Plains Shire, and strong economic and social linkages exist with the town of Goondiwindi in the neighbouring Shire of Waggamba (Queensland) and also with the town of Boggabri in Moree Plains Shire. A more precise specification of cotton growing regions and their economic and social catchments (based on individual Census Collection Districts) is possible if further primary data were to be collected from cotton producers and those businesses and communities with which they interact.

The Namoi region can be further divided into the Upper and Lower Namoi, with the Upper Namoi relating more strongly to the town of Gunnedah and to some extent Boggabri (which is in Narrabri Shire) and Tamworth, and the Lower Namoi relating more strongly to the towns of Narrabri, Wee Waa and Walgett.

### 3.4.1. Context Indicators

The selection of indicators presented in Table 3.4.1 to Table 3.4.3 is largely based on those used by RACD, CARE and Environment & Behaviour (2000), to indicate the sensitivity or vulnerability of forestry related communities to changes in policies affecting the access to forest resources. Therefore, most of the variables relate to aspects of a community that might indicate relative socio-economic vulnerability to adverse shock, such as might be the consequence of reductions in cotton production.

Population change:

This is an overall indicator of economic and social condition. Communities that are growing have a better chance of retaining their economic and social functions. Population decline has been common in inland rural Australia over recent Census periods, for reasons that have been briefly noted above.

Population has been declining since 1991 in most cotton regions and the towns associated with them. Table 3.4.1 to Table 3.4.3, for example, show that in the Namoi and Gwydir regions the population in all LGAs and towns, except one, declined between the 1991 and 2001 Censuses. The exception was the Shire of Walgett, which registered a slight rise. Thus, any positive effect on total population that the expansion in cotton production over the period has had was outweighed by the factors leading to reduced population.

Age distribution and ethnicity

There are four variables presented to summarise the age distribution of the area, namely the percentage of the population aged under 15, the percentage aged 15 to 64, the percentage aged 65 or older, and the 'dependency ratio' which is the number of people aged under 15 or over 64 expressed as a percentage of people aged 15 to 64. In Moree Plains, for example, the percentage of people aged 65 or older is below the State average, while the percentage of children (aged under 15) is higher. Nevertheless, between 1991 and 2001, the number of those aged under 15 in the Shire actually fell, by 13.5 per cent, while the number of people aged 65 or over rose by 14.7 per cent. In many parts of rural Australia, as in Australia generally, the ageing of the population has resulted in an increase in the number of people in the older age groups. This is partly reflected in the dependency ratio, which provides a measure of the balance in the community between people in age groups that are generally not financially independent, and those that are.

Groups within society who are suffering economic or social disadvantage can be particularly vulnerable to adverse shocks in the economy. In rural Australia, Aboriginal people may fall into this category and the proportion of people of Aboriginal or Torres Strait Islander background in the population provides a measure of vulnerability due to this source. The percentage of indigenous people in the population in the Namoi and Gwydir regions is, of course, much higher than in the State population. Table 3.4.4 shows that both the number of indigenous people in each region and the percentage of indigenous people in the population has been rising over the past two Census periods. This partly reflects an increasing willingness (nationally) for people to identify themselves as indigenous. The table also shows that there is a general trend towards increased employment and reduced unemployment rates for indigenous people in these regions, though there are still large differences between these rates and those of the population as a whole in these regions. The improvement in employment outcomes for indigenous people is partly the result of programs targeted specifically at indigenous people in these regions. The cotton industry has indeed been very active in developing and funding these programs.

Unemployment:

This is a widely used indicator of economic activity and opportunity. Unemployment rates for specific age categories, and by sex, can be calculated using the available published data, in order to monitor the labour market performance for specific groups in the community. In these table, we have chosen 15 to 19 year olds to represent youth unemployment (although there is also good reason to include 20 to 24 year olds in this category), and 20 to 44 year old males because these age groups represent the traditional peak working age for males in rural communities, and are more likely to have dependents.

Table 3.4.1 Basic socio-economic profile indicators for towns and the LGA of Gunnedah in the Upper Namoi cotton growing region. Indicators for New South Wales are provided for comparison.

| Profile Indicators | LGA | Towns | | NSW |
|---|---|---|---|---|
| | *Gunnedah* | *Curlewis* | *Gunnedah* | *Boggabri* | |
| Population 1991 | 13,331 | 651 | 8874 | 958 | |
| Population 1996 | 12,819 | 613 | 8315 | 875 | |
| Population 2001 | 11,993 | 575 | 7871 | 803 | |
| % change 1991-1996 | -10.0 | -11.7 | -11.3 | -16.2 | 11.2 |
| % change 1996-2001 | -6.4 | -6.2 | -5.3 | -8.2 | 5.5 |
| *Demographics* | | | | | |
| % aged 14 and below | 24.2 | 28.5 | 23.3 | 23.9 | 20.7 |
| % 15-64 | 61 | 62.4 | 59.3 | 56.3 | 66.2 |
| % 65 + | 14.8 | 9.0 | 17.4 | 19.8 | 13.1 |
| Dependency ratio (a) | 63.8 | 60.1 | 68.6 | 77.6 | 51.1 |
| % Aboriginal or TSI | 10.0 | 11.7 | 10.9 | 7.2 | 1.9 |
| *Labour force* | | | | | |
| Unemployment rate (%) | 9.3 | 19.9 | 10.4 | 23.2 | 7.2 |
| Unemployment rate 15-19 (%) | 17.1 | 0.0 | 18.2 | 26.1 | 16.2 |
| Unemployment rate males 20-44 (%) | 11.1 | 23.3 | 12.2 | 27.5 | 8.0 |
| Participation rate | 59.1 | 52.1 | 54.7 | 45.4 | 62.2 |
| % labourer and related workers | 11.6 | 23.6 | 10.8 | 9.9 | 8.0 |
| % employed in agriculture, forestry and fishing | 21.0 | 13.2 | 7.9 | 16.9 | 3.4 |
| *Education* | | | | | |
| % left school year 10 or less (b) | 62.5 | 70.3 | 63.7 | 67.7 | 45.0 |
| % left school year 9 or less (b) | 27.2 | 33.8 | 28.3 | 33.8 | 18.2 |
| % with no qualifications | 61.6 | 72.6 | 61.8 | 69.6 | 51.5 |
| *Social* | | | | | |
| % families with weekly income <$300 | 6.0 | 3.8 | 5.5 | 4.7 | 3.5 |
| % rental housing | 24.9 | 16.8 | 29.4 | 22.1 | 27.5 |
| % fully owned housing | 46.0 | 53.2 | 43.5 | 53.8 | 41.1 |
| % households with no vehicle | 9.2 | 6.1 | 11.4 | 14.6 | 12.0 |
| % separated or divorced | 9.1 | 10.3 | 9.5 | 9.0 | 10.5 |
| % single parent families | 15.8 | 18.9 | 16.7 | 13.2 | 15.5 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

In almost all LGAs and towns in the Namoi and Gwydir Valleys, overall unemployment rates and the rates for these groups exceed the State averages. The Lower Namoi tended to perform better than the Upper Namoi and Gwydir, indeed in the town of Narrabri the unemployment rate for 20 to 44 year old males was lower than the State average.

Unemployment in towns in the Upper Namoi was still probably reflecting the impact of the closure of coal mines in the Gunnedah region in the years leading up to the 2001 Census. This underlines the importance of taking into account the possible role of other key economic events and trends in the region, when interpreting these data and in understanding the relative role of trends in the cotton industry in explaining economic and social data. Labour force participation tended to be below the State average in the Upper Namoi, but above it in the Lower Namoi and Gwydir. In other words, the latter are 'working communities'.

Table 3.4.2 Basic socio-economic profile indicators for towns and LGAs in the Lower Namoi cotton growing region. Indicators for New South Wales, are provided for comparison.

| Profile Indicators | LGAs | | Towns | | | NSW |
|---|---|---|---|---|---|---|
| | Narrabri | Walgett | Narrabri | Wee Waa | Walgett | |
| Population 1991 | 14,653 | 8,194 | 6694 | 2030 | 2091 | |
| Population 1996 | 14,101 | 8,550 | 6419 | 1860 | 1970 | |
| Population 2001 | 13,817 | 8,310 | 6245 | 1816 | 1826 | |
| % change 1991-1996 | -3.8 | 4.3 | -4.1 | -8.4 | -5.8 | 11.2 |
| % change 1996-2001 | -2.0 | -2.8 | -2.7 | -2.4 | -7.3 | 5.5 |
| *Demographics* | | | | | | |
| % aged 14 and below | 23.3 | 21.2 | 22.2 | 25.2 | 26.2 | 20.7 |
| % 15-64 | 64.3 | 67.4 | 63.7 | 64.7 | 65.6 | 66.2 |
| % 65 + | 12.4 | 11.3 | 14.1 | 10.1 | 8.3 | 13.1 |
| Dependency ratio (a) | 55.5 | 48.2 | 57.0 | 54.6 | 52.6 | 51.1 |
| % Aboriginal or TSI | 7.8 | 21.4 | 8.7 | 14.9 | 41.7 | 1.9 |
| *Labour force* | | | | | | |
| Unemployment rate (%) | 8.1 | 12.9 | 8.6 | 9.8 | 8.8 | 7.2 |
| Unemployment rate 15-19 (%) | 17.5 | 20.6 | 17.1 | 26.5 | 29.2 | 16.2 |
| Unemployment rate males 20-44 (%) | 10.2 | 17.7 | 6.6 | 12.7 | 10.7 | 8.0 |
| Participation rate | 65.3 | 58.9 | 63.0 | 65.8 | 67.1 | 62.2 |
| % labourer and related workers | 11.4 | 14.4 | 11.2 | 14.7 | 14.3 | 8.0 |
| % employed in agriculture, forestry and fishing | 25.4 | 27.7 | 7.4 | 23.9 | 8.1 | 3.4 |
| *Education* | | | | | | |
| % left school year 10 or less (b) | 59.6 | 55.3 | 58.8 | 60.1 | 53.5 | 45.0 |
| % left school year 9 or less (b) | 25.3 | 27.2 | 26.0 | 26.8 | 26.5 | 18.2 |
| % with no qualifications | 62.7 | 60.1 | 62.4 | 64.6 | 60.1 | 51.5 |
| *Social* | | | | | | |
| % families with weekly income <$300 | | | 3.8 | 4.9 | 5.1 | 3.5 |
| % rental housing | 27.8 | 24.3 | 35.2 | 38.2 | 52.9 | 27.5 |
| % fully owned housing | 41.7 | 44.6 | 37.1 | 33.4 | 24.4 | 41.1 |
| % households with no vehicle | 8.6 | 12.3 | 10.7 | 11.9 | 16.4 | 12.0 |
| % separated or divorced | 9.3 | 15.2 | 10.5 | 10.3 | 9.4 | 10.5 |
| % single parent families | 13.8 | 17.4 | 17.1 | 16.7 | 19.8 | 15.5 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

## Education and skills

Table 3.4.1 to Table 3.4.3 indicate that in all cotton growing regions and the towns in those regions, a higher proportion of the adult population had left school at years 9 or 10 than in the State as a whole. This reflects a number of factors, including long-standing attitudes towards further education in many rural areas, the availability of opportunities for further learning, and the availability of relatively low-skilled employment opportunities in many rural areas in the past. These low levels of basic education may affect the capacity of the population to engage effectively in further training or learning opportunities, and inhibit the improvement in skills levels in some sectors of the cotton industry. The percentage of adults with no post-school qualifications is also much higher in all regions and towns

than in the State as a whole, being over 60 per cent in most places, compared with the State figure of 51.5 per cent. .

Table 3.4.3 Basic socio-economic profile indicators for towns and the LGA of Moree Plains in the Gwydir Valley cotton growing region. Indicators for New South Wales are provided for comparison.

| Profile Indicators | LGA | Towns | | NSW |
|---|---|---|---|---|
| | *Moree Plains* | *Moree* | *Collarenebri* | |
| Population 1991 | 16,918 | 10062 | 617 | |
| Population 1996 | 15,517 | 9270 | 544 | |
| Population 2001 | 15,737 | 9,273 | 505 | |
| % change 1991-1996 | -8.3 | -7.9 | -11.8 | 11.2 |
| % change 1996-2001 | 1.4 | 0.0 | -7.2 | 5.5 |
| *Demographics* | | | | |
| % aged 14 and below | 24.3 | 23.1 | 24.8 | 20.7 |
| % 15-64 | 66.6 | 66.2 | 64.8 | 66.2 |
| % 65 + | 9.1 | 10.7 | 10.5 | 13.1 |
| Dependency ratio (a) | 50.2 | 51.1 | 54.5 | 51.1 |
| % Aboriginal or TSI | 17.8 | 21.1 | 36.0 | 1.9 |
| *Labour force* | | | | |
| Unemployment rate (%) | 9.3 | 11.6 | 13.3 | 7.2 |
| Unemployment rate 15-19 (%) | 17.9 | 20.5 | 33.3 | 16.2 |
| Unemployment rate males 20-44 (%) | 11.1 | 14.0 | 22.7 | 8.0 |
| Participation rate | 68.5 | 66.0 | 63.0 | 62.2 |
| % labourer and related workers | 13.1 | 10.4 | 19.3 | 8.0 |
| % employed in agriculture, forestry and fishing | 28.1 | 10.4 | 19.2 | 3.4 |
| *Education* | | | | |
| % left school year 10 or less (b) | 54.8 | 54.6 | 58.5 | 45.0 |
| % left school year 9 or less (b) | 23.5 | 24.0 | 32.5 | 18.2 |
| % with no qualifications | 60.7 | 59.3 | 68.0 | 51.5 |
| *Social* | | | | |
| % families with weekly income <$300 | 5.4 | 4.7 | 8.7 | 3.5 |
| % rental housing | 34.8 | 43.7 | 45.9 | 27.5 |
| % fully owned housing | 33.3 | 29.5 | 33.5 | 41.1 |
| % households with no vehicle | 11.5 | 14.9 | 21.9 | 12.0 |
| % separated or divorced | 9.9 | 10.7 | 9.4 | 10.5 |
| % single parent families | 16.1 | 19.9 | 22.4 | 15.5 |

(a) Population aged under 15 or 65 and over, as a percentage of those aged 15 to 64.
(b) Includes those who never went to school.

## Other indicators

There are a number of other indicators in addition to those discussed above that also provide a range of insights into the social and economic conditions within a community. In most parts of the Namoi and Gwydir Valleys, there was a higher proportion of families with a weekly income below $300 than in the State as a whole. The difference was less marked in the towns than in the LGAs as a whole, except for the town of Collarenebri. This is likely to be associated with the high proportion of indigenous people in that town.

Table 3.4.4 Socio-economic profile indicators for the indigenous population for towns in the Gwydir Valley cotton growing region.

| Indicators | LGAs | | | |
|---|---|---|---|---|
| | *Gunnedah* | *Narrabri* | *Walgett* | *Moree Plains* |
| *Indigenous population* | | | | |
| 1991 (%) | 730 (5.5) | 737 (5.0) | 1502 (18.3) | 2375 (14.0) |
| 1996 (%) | 999 (7.8) | 1003 (7.1) | 1764 (20.6) | 2615 (16.9) |
| 2001 (%) | 1204 (10.0) | 1084 (7.8) | 1781 (21.4) | 2807 (17.8) |
| *Number employed* | | | | |
| 1991 | 131 | 107 | 301 | 321 |
| 1996 | 186 | 176 | 335 | 400 |
| 2001 | 240 | 211 | 395 | 539 |
| % ch. 1991-1996 | 42.0 | 64.5 | 11.3 | 24.6 |
| % ch. 1996-2001 | 29.0 | 19.9 | 17.9 | 34.8 |
| *Number unemployed* | | | | |
| 1991 | 94 | 99 | 192 | 356 |
| 1996 | 75 | 76 | 137 | 298 |
| 2001 | 82 | 68 | 150 | 282 |
| % ch. 1991-1996 | -20.2 | -23.2 | -28.6 | -16.3 |
| % ch. 1996-2001 | 9.3 | -10.5 | 9.5 | -5.4 |
| *Unemployment rate* | | | | |
| 1991 | 41.8 | 48.1 | 38.9 | 52.6 |
| 1996 | 28.7 | 30.2 | 29.0 | 42.7 |
| 2001 | 25.5 | 24.4 | 27.5 | 34.3 |
| % ch. 1991-1996 | -31.2 | -37.2 | -25.5 | -18.8 |
| % ch. 1996-2001 | -11.4 | -19.2 | -5.2 | -19.7 |

The percentage of private dwellings that are fully owned is a measure of economic stability. For example, in the face of volatile interest rates, the higher this percentage, the less stress it will impose on the community. It might also be interpreted as an indication of population stability (the length of time residents have been in the one place). On the other hand, high levels of rental housing could indicate economic vulnerability and impermanence. The levels of rental housing in both Namoi and Gwydir Valleys are in general above the NSW State average. The levels of full home ownership are more variable in comparison to the State average, with the Upper Namoi being slightly above, and the Lower Namoi and Gwydir mostly below, especially in the towns. The latter may be connected to the presence of significant numbers of seasonal workers in the Lower Namoi and Gwydir.

A relatively high proportion of households with no vehicle can indicate that some people in a community may have problems accessing services. Collarenebri, Walgett and Boggabri have higher proportions of households with no vehicles, compared to the other towns in the Namoi and Gwydir regions.

The proportion of divorced or separated people, and the proportion of single parent families, can, if taken with other indicators such as household income provide a measure of the possible incidence of social problems such as social isolation, domestic violence, and poor mental and emotional health. As such, these indicators are measures of both the existing social stresses within a community, and the capacity of that community to cope with further sources of stress.

In this respect, it should be noted that, because social indicators are aggregate measures, they provide little information about the social and economic condition of particular small groups which may be substantially better or worse off than the majority in the community. The social indicators presented in this section tend to focus on social vulnerability, and as such can be expected to show changes when

the less well off in the community are being impacted by adverse shocks in the regional economy. For some purposes it may also be relevant to look at indicators that reflect the social condition of those people whose experience of economic change has been more positive, for example, the proportion of adults with tertiary qualifications, the proportion of adults with tertiary qualifications in agriculture, or the proportion of households with weekly income greater than $2000.

### BOX 3: SUMMARY

The economic and social changes occurring within regional economies and communities can no longer be understood solely in terms of the changes occurring in primary industries. This means that care has to be taken in identifying changes attributable to the cotton industry. The causes of these changes are clearest where cotton dominates agricultural production and the size of the non-farm economy is relatively small. In other areas, the ethnic composition of the population and broader changes in community aspirations, retailing and transport may result in social and economic impacts that outweigh any effects of the cotton industry.

The part of the cotton supply chain that has the greatest impact in rural areas is that from cotton growing through to lint production. With the knowledge intensity of cotton production, there is a particularly large and diverse range of firms and organisations providing physical and informational inputs to the industry. Among these inputs, the proportion of expenditure by cotton growers that is retained locally ranges from very small (e.g. chemicals where only the retailer's margin is retained locally, with the remainder going to wholesalers and manufacturers outside the cotton growing regions), to a very large proportion (e.g. consultant agronomists who spend most of their income locally).

The cotton industry also has an important effect in some regions through agglomeration economies, the presence of knowledge intensive services and the building of social capital.

Given these linkages between the cotton industry and regional economies and communities, changes in the industry are likely to have flow-on effects in these economies and communities. There are a range of social and economic indicators available from secondary data sources that provide a measure of the vulnerability of communities to these changes. These include indicators relating to population change, age distribution and ethnicity, unemployment, education and skills, and a number of indicators relating to social well-being.

# 4. Local Impacts of the Industry

## 4.1. Introduction

As stated in Chapter 1, the scoping study aimed to gain an appreciation of the socio-economic impacts of trends in the cotton industry on local communities and economies. To this end, a series of interviews were conducted with business people and other key informants in the Gunnedah, Narrabri, Wee Waa and Moree districts. These interviews provided an indication of the scope of these impacts, but were not intended to compile a comprehensive and quantitative assessment. Because of the geographical focus, it is possible that some impacts specific to other cotton growing regions have not been identified. While some interviewees volunteered quantitative information as to changes affecting their business or areas of operation, this has not been included as it would be inappropriate to generalise from the small sample of businesses and organisations interviewed. A list of interviewees is provided in Appendix 2.

## 4.2. Fertiliser and Chemical Retailers

A fertiliser and agricultural chemical retailer in the Namoi valley who was interviewed for the study reported that they had decreased the number of staff employed over the last few years. Approximately one half of this business's sales were to cotton growers, but this proportion was expected to decline in the coming years. The increased use of transgenic varieties (see section 2.3.7) was seen as the main cause of this decline.

A response by some retailers to declining chemical use has been to offer more knowledge intensive services, such as a wider range of agronomic advice and the inspection and calibration of spray rigs.

The severity of the impact of transgenic varieties and decreasing chemical use on retailers will depend upon the extent to which these retailers have diversified, or can diversify, into serving other agricultural industries.

## 4.3. Aerial and Ground Spraying Services

The decline in chemical use appears also to be having an impact on firms providing aerial and ground spraying services. A number of firms have responded by diversifying outside the cotton growing regions, or by developing business enterprises to service the cotton industry in other ways, such as technology to improve water use efficiency.

## 4.4. Machinery and Other Capital Inputs

The growing and processing of cotton uses a vast array of purchased capital inputs. Over recent decades, the substitution of capital for labour on Australian farms has been a major aspect of the adjustment to changing economic circumstances, and the cotton industry illustrates this trend very well. In recent years, the substitution of capital for labour has involved the purchase of capital inputs that are highly knowledge intensive, such as improved machinery and irrigation plant, improved seed and chemicals, and improved ginning, transport and electronic equipment. These improved capital inputs are mostly designed and built in places far removed from the cotton growing region, so that much of the value of the purchases of these inputs 'leaks' from the local region. The local component of their value, however, is in a sellers margin, and in the skills necessary for the servicing and repair of the wide range of plant and machinery.

The retailing of major items of machinery is a competitive industry sector, with several dealers being represented in the region. As elsewhere, there are pressures for concentration and rationalisation of dealer networks and dealer presence in some towns. This rationalisation (closing of branches) is more likely in periods of downturn for the industry, such as in a drought, and would be unlikely to be reversed when the drought breaks. For the major machinery dealers, the sale of new machinery is crucial to their economic viability, and downturns can not be adequately weathered by the substitution

of other services. Nevertheless, it appears that some of the smaller towns have been more successful in retaining the presence of firms that supply and service capital items for the cotton industry than they have in retaining firms that supply household goods and services (e.g., Wee Waa).

## 4.5. Research Centres

As described in section 3.2.3, the cotton production is one of the more knowledge-intensive areas of agriculture. Pest resistance, increasing community environmental awareness, the need for varieties suited to regional climatic conditions, competing demands for surface water, changing market demands for quality, and the need for increased yields to offset the cost-price squeeze are some of the forces that have driven, and will continue to drive, the development of new knowledge and technology. This may lead to changes in the demand for certain types of research skills. Given the mobility of research staff, and the transferability of these skills into other areas of agricultural production, these changes are unlikely to lead to significant unemployment problems. The mobility itself, however, may have some social impacts via the families of researchers, such as turnover of enrolments in schools reducing the stability of children's friendship networks.

## 4.6. Consultancy Services

An increasing range of skilled consultants and other professionals is now used in the cotton industry. Some of these are relatively mobile, and choose their home base on the grounds of a wide range of factors, including their access to a range of household related goods and services, and the availability of work for their partners. For some services, such as the management of market risks, it may not be necessary for the consultancy service to be located in a cotton growing region. The trend to increasing knowledge intensiveness, coupled with improvements in computer and communications technology may reduce the capacity of a cotton community to capture service industry expenditure and the household-related spending of those working in the service industries. This is because a lesser proportion of the expenditure on this technology remains locally, compared to the wages from the labour inputs or locally manufactured items the technology replaces.

## 4.7. Steel Fabricators

As mentioned in section 2.3.5, aggregation of cotton growing properties in response to current, and perceived future, pressures on the availability and price of irrigation water has been followed by modifications to irrigation infrastructure to obtain water efficiency gains. One impact of this, reported by one of the businesses interviewed, a major steel fabricator supplying about half of the Namoi valley, has been a marked increase in the demand for pumping machinery, associated steel fabrication, and other fabricated items such as irrigation gates. This increase in demand has apparently, for the particular business, offset an anticipated contraction in business due to the dry conditions of the last year.

A second source of the increased demand for steel fabrication services, also mentioned by the business interviewed, appears to be the government requirement, at least in New South Wales, for upgrading the design of irrigation pumping machinery, ginning machinery, and seed processing machinery to comply with tighter occupational health and safety rules (see section 2.3.8).

In the medium to long term, it is likely that these two sources of demand for steel fabrication services may become less important. However, there will continue to be demand for these services for maintenance of existing irrigation infrastructure. The wide range of suction lifts, delivery heads and volumes required in pumping installations means that new pumping infrastructure will continue to require fabrication of custom made units for the foreseeable future. Where steel fabricators are currently serving only the irrigation industry, any future contraction in demand may be offset by broadening the diversity of fabricated products to include those used by the pastoral industry, transport industry and by processors of agricultural commodities.

## 4.8. Transport Firms

Road transport plays an important role in the transport of cotton to the gins, and in the transport of lint out of the cotton growing regions. In the latter case, road transport may face greater competition from rail in the future, and this may result in the loss of local employment in driving and mechanical servicing of semi-trailers.

## 4.9. Oil Seed Crushers

The increasing use of transgenic cotton varieties (see section 2.3.7), is likely to have impacts on the vegetable oils industry. A crushing business interviewed for the study expressed concerns that there was a decreasing amount of cotton seed from non-transgenic varieties available. Given the public concerns in Australian and European markets for edible oils and seedcake for livestock, this decrease was seen as posing a threat to the range of markets to which oil seed crushers would be able to access. Concern was also expressed about the possibility of contamination by transgenic seed, due to the lack of facilities at cotton gins for the segregation of transgenic cotton.

It was reported that there was an increasing number of cotton farmers who were choosing to market their own seed, rather than selling it to the dominant processor in the region. This has provided opportunities for other manufacturers and packagers of stock feed products in the region.

## 4.10. Cotton Ginning

The ginning of cotton is an important contributor to the local economy, since it employs significant numbers of local people during the ginning season. It also requires inputs from local engineering and supply firms.

## 4.11. Other Retailers

There are strong linkages between the cotton industry and the retailers of household goods and services, because of the number of people employed in the industry (including the businesses servicing it). The incomes of people employed in the cotton industry are also likely to be higher on average than the income of those employed in agriculture generally, so that the flow-on effects of their spending is potentially higher. This might be offset to some extent, however, by the possibility that they also spend more of their household incomes outside the region of production.

Cotton communities vary greatly in the degree to which they are the location for a range of household related goods and services. There are usually important complementarities between different items of spending; for example, there may be a higher propensity to make household-related expenditures in a town where one's children go to school, or where major needs such as doctors and dentists can be met, or where the social ambience and interest are of higher quality. In other words, the 'marginal propensity to spend locally' can vary for a wide range of reasons. In general, however, the trends in the rural economy are for the smaller local places with a limited range of 'central place functions' to be losing their share of rural consumer spending to the larger centres that provide a wider range and higher quality of competitive businesses. These larger towns now serve a much larger trade and social catchment than in the past. The increase in the size of trade and social catchments has been made possible by the improvements in the road infrastructure.

## 4.12. Caravan Parks and Motels

Because of the seasonality of several of the key labour-using tasks in the production and processing of cotton, an important economic linkage is the demand for temporary accommodation, particularly in mid-summer (traditional chipping season). The demand for temporary accommodation is always going to be influenced by the variation in areas sown, due to water availability, and so there is likely to continue to be some variability in the flow-on to caravan parks and a shortening of chipping, harvesting

and ginning seasons. A second influence is the trend towards cotton varieties that will require less seasonal labour, or perhaps a shortened season for chipping.

Because of the trend towards the purchasing or contracting of goods and services requiring more highly skilled labour, and because this labour input may tend to be more mobile and not necessarily resident in the region, there may be also an increasing demand for higher quality short-term accommodation such as in motels or short-term leases of private accommodation.

### 4.13. Local Government

Local government councils in cotton growing areas benefit from an increase in rural land values, in that it allows them to levy higher rates and therefore increase their revenues. This capacity will be reduced, however, to the extent that reductions in access to water by irrigators results in reduced values of cotton properties and water licenses. Any reduction in rate revenues from cotton growers will have to be offset by reduced expenditure and/or by raising more rate revenue from other landholders. The impact of this redistribution of rate burden is uncertain.

Local government is also responsible for the building and maintenance of many roads, and to the extent that the cotton industry generates increased heavy vehicle traffic, and demands for roads that are serviceable in all weather conditions, there may be increased demands on council expenditure.

As the wealth and aspirations of an increasingly sophisticated local cotton community rise, there may also be increased demands from local residents for the provision of a wider range of social and community amenities by local government. Such provision may be necessary in order to attract and retain the quality of workforce that the cotton industry increasingly requires.

### 4.14. Social Services

All rural towns, especially in regions where total population is declining, are facing increasing pressures on their ability to support the increasing range of social services and amenities. For example, their capacity to attract and retain medical professional such as GPs and dentists is declining. These are, however, the sort of services that are important in influencing the willingness of the highly skilled individuals employed in the cotton industry to come to or remain in a cotton growing region. An additional factor is the increasing tendency for both partners in a family to be seeking skilled employment in a region, and therefore being more likely to locate in one of the larger towns in a region.

One of the most important social impacts of the industry is the seasonal labour demands, which tend to attract itinerant and often low-resource people to the region in search of this work. Many of those seeking work arrive with low financial resources and without accommodation arranged. Rents in some cotton communities can also be beyond the reach of such people. This can place heavy demands on local providers of welfare services, and generate adverse social impacts such as increases in crime rates. The industry appears to be increasingly aware of this issue, however, and in at least one region has supported projects to address it (Laws, 2002).

### BOX 4: SUMMARY

In interviews with key informants in the Namoi and Gwydir Valley cotton growing regions, a number of people were able to identify changes they were experiencing that were a direct result of changes occurring in the cotton industry. These included falls in employment in chemical retailers, diversification of firms supplying aerial and ground spraying services, an increase in demand for steel fabrication work due to aggregation of cotton farms and compliance with OH&S requirements, and falls in employment in the oil seed crushing industry

However, there were also changes occurring in towns in the Namoi and Gwydir Valleys that were symptomatic of the broader changes occurring in rural Australia. For example, some of the smaller towns in the Namoi and Gwydir cotton growing regions appeared to be losing some retail service functions to the larger centres, due to the growth of the latter and consequent expansion of retailing diversity, and the improvement in road infrastructure.

# 5. Impacts for Future Monitoring

## 5.1. Introduction

Chapter 2 described some of long term trends occurring in the cotton industry. Chapter 3 discussed the main causes of change in regional economies and rural communities, before turning to one of the more important causes of change in the cotton growing regions, viz. the linkages between the cotton industry and regional economies. Chapter 4 reported on some of the changes that were identified by people in firms and organisations with linkages to various parts of the cotton supply chain.

This chapter draws on the trends, linkages and impacts described in the three previous chapters and identifies a number of impacts which, it is believed, should be given consideration in any program of research and monitoring by the cotton industry which aims to support prosperous regional communities with a high level of social amenity. However, it should be pointed out that the impacts and changes identified in the ensuing sections are not the only ones that the industry might to wish to consider. In other contexts, such as advocacy and public relations, the emphasis could be quite different, focusing on, for example, quantifying the economic contribution of the industry to regional economies, or enumerating the philanthropic initiatives of the industry, or quantifying the contribution of people in the industry in volunteer roles within community organisations in the cotton growing regions.

The discussion that follows is divided into three sections. The first section discusses the issue of distinguishing between the impacts of cotton research and development on the one hand, and the cotton industry on the other. The second section deals with a number of changes that are occurring in at least some of the cotton growing regions and which can be attributed to the cotton industry, or to changing availability of the water resources on which the industry depends. The second section deals with changes not directly attributable to the industry. These are changes that are occurring in many areas in rural Australia for the reasons outlined in section 3.1. These changes place stresses on rural communities which may affect their capacity to provide the human and social capital required by the cotton industry, as well as affecting their ability to adjust to any additional sources of change originating in the industry.

## 5.2. Impacts of R&D and the Industry

There are two approaches that can be taken to assessing the socio-economic impact of cotton research and development. The first involves detailed study of individual research projects to identify the impact that each has had on cotton production, and how these impacts in turn have effects on the economy and communities in the cotton growing regions. While such an approach provides detailed knowledge of the linkages between cotton research and socio-economic impacts in the cotton growing regions, it would be prohibitively expensive if it were to be applied across a large number of projects in an attempt to make an assessment of the overall impact of cotton research.

The second approach involves a more careful definition of the question which socio-economic impact analysis attempts to answer. Because cotton production is unlikely ever to be carried out in the absence of ongoing research and development, it makes little sense to attempt to gauge the difference between the industry with research and development and the industry without research and development. Research and development does not occur in a vacuum — it is closely linked to the national and international needs of the industry, and the evolution of the industry is closely linked to the achievements in research and development. Consequently, it also makes little sense to attempt to distinguish between *trends* in research and development, and *trends* in the cotton industry. The same argument applies to the industry as a whole. The cotton industry is a permanent feature of many irrigation regions, and it makes little sense to attempt to gauge the difference between regional economies and communities with and without the cotton industry.

For these reasons, the preferred approach (and the one taken in this scoping study) should be to examine the trends occurring within the industry as a whole (including the research and development sector) and to assess the socio-economic impacts of these trends in the cotton growing regions.

## 5.3. Impacts Specific to the Cotton Industry

### *5.3.1. Immediate regional impacts of changes in volume and value of cotton production*

Given that there are some factors that could lead to changes in the volume of cotton produced and its value, the monitoring of any effects this might have on the local economy will be of primary importance. Growers will respond to the reduced availability of water, for example, in a number of ways in different regions, and this is likely to have impacts on the mix of inputs used in cotton production, as well as on the substitution of other crops for cotton, and perhaps in the level of further local processing of cotton and other farm products. This would require the collection of primary data covering these impacts in one or more regions, and would build the Cotton Research & Development Corporation's understanding of the ways in which the industry relates to the regional economy.

### *5.3.2. Unskilled labour*

Given that some of the trends identified are expected to reduce the demand for relatively unskilled seasonal labour, the extent to which this occurs, and its economic and social impacts if it does occur, should be monitored. The increasing knowledge intensity of any industry, including the cotton industry, can result in the shedding of unskilled labour as technology substitutes for labour. The extent to which local residents employed in unskilled seasonal work are able to find other jobs, possibly after acquiring further skills, should also be monitored.

### *5.3.3. Social division*

As governments continue to introduce measures to manage the allocation of water resources in the face of increasing demand, the ways in which the resource is allocated amongst competing uses (stock and domestic use, irrigated agriculture, town water supplies, and the maintenance of ecosystems) will raise a number of equity issues, both between those competing users at a point in time, and over periods of time. These equity issues arise whenever there are changes in the rules governing access to resources, since rule changes create 'winners' and 'losers'. Equity issues involve perceptions of fairness, and the factors that influence perceptions of fairness are complex.

At the same time, the harmonious functioning of communities draws on stocks of 'social capital' that underpin shared norms, trust, and the willingness to cooperate for the common good of the community. Conflicts between groups in a community, and perceptions of inequity within groups, can greatly impair or prevent the achievement of community goals. In small towns in particular, resentments can endure.

The Groundwater Sharing Plans currently being introduced into the Namoi valley illustrate the difficulties of introducing changes to longstanding resource access rules and the consequent threats to community cohesion. These difficulties are compounded by the inherent uncertainty surrounding key hydrological estimates vital to the management of the resource. Namoi irrigators affected by this uncertainty and the changed rules, have expressed their anger at a number perceived inequities, including the uncertainty in the rules expressed by those whose businesses depend on forward planning and investment (Upper Namoi Water Users Association 2003).

These concerns suggest that a breakdown of trust is emerging between those in the community whose responsibility it is to manage the resource well and those whose livelihoods depend on this good resource management.

Accordingly, it may be important for the cotton industry to define and monitor measures of 'social capital' in order to forestall any potential erosion that would inhibit the industry's capacity to meet the challenges of reduced resource access. A substantial literature now exists on the measurement of social trust and community cohesion (see, for example, Black and Hughes (2001); Brooks, Kelson and Tottenham (2001).

## 5.4. Impacts of Generic Rural Factors

Businesses in the smaller rural towns will continue to experience competitive pressure from businesses in the larger towns, as a result of economic changes in a range of industries, and as a result of social changes in rural Australia generally This will make it increasingly difficult for the smaller places to continue to provide the range of economic and social goods and services they do at the moment. For example, the attraction and retention of skilled professionals such as doctors and dentists will become increasingly difficult. This will in turn make it increasingly difficult for the cotton industry to attract and retain the sort of skilled people who are important to the industry's improved productivity. Accordingly, it is in the industry's interests to continue to monitor the general economic and social condition of cotton communities, and to become proactive in seeking to improve those conditions, beyond those actions that are directly related to industry performance.

Another trend is the ageing of the rural community. There are two aspects of this: first, increases in the proportion, and often the absolute number, of older people in rural communities, and second, the tendency for young people, and/or for families with school aged children, to leave rural areas to seek better educational and employment opportunities elsewhere. This can make it difficult to fill entry-level positions in careers in the cotton industry. The ageing of the community also places increasing financial pressure on local government and other agencies that provide the services required by an ageing population.

The future of the cotton industry depends, in part, on the capacity of the community to improve the provision of social services and amenities. In places that cannot provide this, the contribution of the cotton industry to the growth of diverse and prosperous commercial sectors in rural towns will be relatively limited. For these reasons, it is important for the Cotton Research & Development Corporation to ensure that the generic rural changes occurring in the cotton growing regions are monitored.

### BOX 5: SUMMARY

There are two sources of change within the socio-economic fabric of the cotton growing regions: the cotton industry itself, and the generic pressures that all rural areas in Australia are experiencing.

In the case of the cotton industry, there are three areas in which monitoring of impacts would be desirable:

- the immediate impacts in the cotton growing regions of changes in the volume and value of cotton production due to such factors as global price fluctuations and variation in the availability of irrigation water,
- the changes in the demand for unskilled labour in the industry and the well-being and opportunities for those who can no longer find employment in the industry, and
- any changes that are occurring in the levels of social capital within the cotton growing regions that may threaten social cohesion of communities and their ability to work together and with natural resource managers in developing the institutions needed in allocating scarce water resources.

The generic pressures that all rural areas experience may result in the industry having increasing difficulty in attracting to the cotton growing regions the high levels of human capital that a knowledge intensive industry requires. In addition, the out-migration of younger age groups in rural areas decreases the pool of talent available for entry level positions in the industry. For these, and other, reasons, it is in the industry's interest to monitor these generic changes in the cotton growing regions, so that it is in a position to respond in a pro-active way when needed.

# 6. INDICATORS

## 6.1. Introduction

Having identified the key socio-economic impacts that the cotton industry needs to consider in future programs to support prosperous regional communities with a high level of social amenity, it is necessary to choose the indicators which can be used to monitor these impacts and the outcomes of industry responses. The choice of socio-economic indicators involves striking a balance between a number of sometimes conflicting requirements. These include: acceptable precision and certainty, low cost of measurement, and general agreement as to how indicators are to be interpreted. Considerable experience has been gained with economic indicators that have been used extensively in national accounting systems and macro-economic and fiscal policy. On the other hand, measurement of social indicators to inform social policy has fallen in and out of favour during the latter half of the 20th century (Borgatta and Montgomery, 2000).

During the 1990s, a number of developments have brought a renewed interest in social indicators. Internationally, corporations have endeavoured to respond to community demands that they be more accountable for the socio-economic impacts of their activities. In addition, the rise of state of the environment reporting has increased the interest in measures of environmental awareness among the populace. Within Australia, as government policies to protect the environment and encourage efficient resource use in rural areas have been implemented, there has been growing concern amongst those affected by these policies that insufficient attention has been given to their socio-economic impacts.

Consequently, there is much work in progress at the present time, but as yet no particular methodology or collection of social and economic indicators that could be said to be the 'standard' for monitoring change in rural areas or industries (Lambert and Elix, 2002, provide a review of many of the projects being undertaken in Australia as at February, 2002). However, the process that has been used in the Regional Forest Agreements is probably the most advanced in Australia and has much to offer as a model (see Brooks, Kelson & Tottenham, 2001).

There a number of key concepts that have emerged from the Agreements and from other work that are reviewed briefly in the following sections, before turning to the question of the choice of indicators for the cotton industry and cotton industry research and development.

### *6.1.1. Impacts involve causal chains*

The sequence of discussion in this paper has followed a causal chain. It has started with a discussion of trends occurring in the cotton industry (Chapter 2). In Chapter 3, the linkages between the cotton industry and the regional economy were described. It is through these linkages that the trends described in Chapter 2 cause changes within regional economies and in communities in the cotton growing regions. These changes, or impacts, were described in Chapter 4).

There is, then, a chain of causation starting with international pressures on the industry, with technological innovation, and with domestic pressures for more efficient resource use and lower environmental impact. The end of the chain, for the purposes of this study, is the social and economic changes in the communities in the cotton growing regions. It is also recognised, however, that there are impacts outside of the cotton growing regions.

It is possible to choose socio-economic indicators at any point along the chain. Indicators can monitor the pressures on the industry, the state of the industry, the direct impacts on businesses serving the industry or the indirect impacts on other businesses and well-being more generally in the cotton growing regions and beyond. The positioning of indicators along a causal chain is a concept that has been used in state of the environment reporting in Australia and overseas (OECD, 1994; Lowe, 1998).

### *6.1.2. Certainty varies along causal chains*

As the locus of measurement of indicators moves from the pressures on the industry through to the indirect impacts in the cotton growing regions and beyond, the level of certainty as to the causes of changes in the measured levels decreases. For example, and as discussed in section 3.1, the decline in

the range of service functions in small towns in cotton growing regions may have relatively little to do with trends in the cotton industry, and much more to do with a range of changes that affect rural Australia more generally.

For this reason, the further along the causal chain indicators are measured, the more likely it is that they are measuring the effects of many factors other than those of immediate interest to the cotton industry.

### *6.1.3. Indicator choice is iterative*

Choice of socio-economic indicators demands some understanding of the economic and social systems that are being monitored. Chapter 3 provided a preliminary scoping of the linkages between the cotton industry and regional economies and communities. The set of indicators recommended in section 6.2, below, is based on this scoping. Once these indicators are being monitored on a regular basis, and further research is undertaken to develop indicators not presently available from secondary data, this will result in an improved understanding of the relationship between the cotton industry and regional economies and communities in the cotton growing regions. This improved understanding will generate a need to add, replace or refine the range of indicators being monitored. Unanticipated events may also give rise to a need for new indicators.

Consequently, triple bottom line accounting for cotton research and development will need to be responsive to changing concerns and priorities in the cotton growing regions and beyond, and to the improved understanding of the industry's relationship with regional economies and communities. A program to support prosperous regional communities will need not only to measure changes in a set of indicators, it will need to periodically review the relevance of these indicators in the light of the new knowledge generated by them, and in the light of changing concerns and priorities among the industry's stakeholders.

## 6.2. Recommended Indicators

Because of the different stages of development of the cotton industry in the different cotton growing regions, indicators will need to be disaggregated at least to the level of the separate regions. As mentioned in section 3.4, groupings of Census Collection Districts would provide the most precise geographic matching of ABS Census data to the cotton growing regions. For other secondary sources based on sample surveys, such as ABS Labour Force Surveys and ABARE Farm Surveys, the confidence intervals at the level of separate cotton growing regions may be too wide for these sources to be useful. However, such secondary data could still provide useful information at the national or State level.

### *6.2.1. Basic cotton production indicators*

Measures such as area planted, yields, volume of production and value of production are already being collected. However, to understand the immediate impacts on the local economy caused by variations in these quantities, some primary data collection would be necessary, such as periodic surveys of businesses providing services to the industry.

### *6.2.2. Human capital*

Indicators such as levels of schooling, qualifications, and occupations, in various sectors of the cotton industry in the region can mostly be compiled from secondary sources such as the ABS Census, however primary data collection would be needed from time to time for specific qualifications or occupations that are important in the industry. For data compiled from the Census, the 1991 and 1996 Censuses should be included and changes in indicators in the 1991-96 and 1996-2001 inter-Censal periods calculated.

Age- and sex-specific unemployment profiles can also be compiled from Census data and allow unemployment problems among specific groups to be identified.

In addition to measures of the stock of human capital, it is also important to monitor the factors that result in changes to this stock. The combination of age-specific net migration profiles and age-specific

qualification profiles provides information on which skills are being lost and gained in cotton growing regions. The former can be compiled from publicly available ABS Census data, while the latter would have to be purchased from ABS. These profiles would need to be supplemented by primary data collection from in-migrants and out-migrants to provide background information as to the factors causing population movement.

There is a wide range of indicators that could be measured to provide information on involvement in education and training by various sectors of the industry. These could, in theory, be compiled from information on enrolments at educational and training institutions and attendance at field days and industry workshops. However, substantial effort would be required to identify the education and training activities to be included, and to ensure that the indicators were measured in a consistent way from one time period to the next.

### 6.2.3. Social capital

While the concept of social capital is useful in explaining the ability of rural communities to adapt to change, it is difficult to measure directly. There are, nevertheless, a number of surrogate indicators that provide some measure of the strength of social capital in a region. The interpretation of these indicators at any one point in time can be difficult or contentious. However, as data accumulate over time, the indicators begin to provide useful information as to trends occurring in a community. Possible social capital indicators include:

- the number and level of activity of key local groups within the cotton industry.
- the level of involvement of cotton industry stakeholders in community-wide groups and activities,
- attitudinal measures of trust and cooperation both within the cotton industry and between the industry and the rest of the local/regional community, and
- attitudinal measures of trust and cooperation between the industry in the region and stakeholders beyond the region, both government and non-government.

Such indicators of necessity have to be compiled from primary data, and the design and analysis of longitudinal surveys to provide this data is a specialised task.

### 6.2.4. General rural indicators

The tables provided in section 3.3 contain a basic selection of indicators for measuring socio-economic changes in rural areas. This information, being based on ABS Census data, is only available at five year time intervals. For this reason, it is more suited to monitoring the broad, long-term trends occurring in rural areas, than to identifying and responding to specific social or economic problems at occur over a period of a few years. Nevertheless, it is important that cotton research and development, in setting longer term strategic directions, be aware of the trends in the communities and economies where the industry operates.

It is also necessary to collect information on specific local events in order to be able to place the observed changes in the general rural indicators in the context of other factors that influence them. These events include:

- changes in the level of activity of other industries in the region (e.g, the establishment or closure of a significant local employer),
- changes in policies affecting the cotton industry and other local industries (e.g., changes in access to water),
- government and community programs targeted at affecting the local economic and social condition (e.g., local employment programs), and
- significant climatic events.

Recording of these types of events does not require specific on-going monitoring programs. Rather, it could be done at relatively low cost through employment of a press clipping service to maintain an

archive of local newspaper reports in each cotton growing region that covered significant events such as those listed above.

## 6.3. Strategic Directions

At a strategic level, there are three directions that can be pursued in providing a comprehensive compilation of social and economic indicators for the cotton industry. These three directions are not mutually exclusive, rather a balance would be struck between them depending on the strategic goals of research and development.

Firstly, indicators can be compiled for use in policy advocacy and public relations. In this context, indicators are chosen with regard to the needs of the audience and may be insufficient to provide an understanding of the relationship between the industry and regional communities and economies. This study has not included any consideration of these types of indicators.

Secondly, indicators can be compiled with a view to improving the understanding of how changes in the cotton industry impact upon the economy and communities in the cotton growing regions. With this understanding, and on-going monitoring, it is possible for the industry to appreciate in advance when emerging technologies may have the potential to have adverse social or economic impacts. Armed with this knowledge, it is then possible for the industry to manage the introduction of new technology in such a way as to minimise these impacts. It is also possible to anticipate the impacts of variability in production or value of production due to price volatility or water scarcity, and plan to ameliorate these impacts.

Thirdly, indicators can be compiled as a means of keeping abreast of the broad. long-term changes that are occurring in all rural areas. With an appreciation of the nature of this change, it is possible for the cotton industry to anticipate which aspects may impact upon its interests, such as the ability to attract the high level of skills needed in the industry in the cotton growing regions. With this knowledge, and in partnership with local governments and economic development organisations, it is then possible for the industry to contribute to maintaining the requisite levels of prosperity and amenity in the cotton growing regions.

## 6.4. Triple Bottom Line Accounting for CRDC

The indicators described in section 6.2, above, provides a basis for the social accountability component of triple bottom line accounting by the Cotton Research and Development Corporation. A program to support the social accountability component should provide a balance between developing the understanding of the linkages between the cotton industry and the prosperity and social amenity of the cotton growing regions on the one hand and, on the other, monitoring indicators such as those described in section 6.2. As discussed in section 6.1.3, the results of monitoring will inform the understanding of the linkages, and the understanding of the linkages will inform the choice of indicators. The relationship between understanding and monitoring therefore needs to be supported by periodic reviews, in which the indicator set is revised in the light of emerging knowledge about the socio-economic impacts of the industry, and in the light of emerging issues of interest to the industry. The design of the social and community accountability program should give consideration to including the sub-programs described below. The sub-programs are given the prefixes ‘U’ (Understanding), ‘M’ (Monitoring) and ‘R’ (Review) to characterise the main purpose of each sub-program and show its relationship with other sub-programs. The relationship between sub-programs is summarised in Figure 6.4.1

### *6.4.1. M1: Biennial service industry survey*

This survey would provide qualitative and quantitative information from the firms that service the cotton industry on emerging issues that may have implications for the prosperity and social amenity of the cotton growing regions. Consideration could be given to establishing a longitudinal panel to provide this information, i.e. the same set of firms are contacted each round of the survey. For cost-effective social and community responsibility, it is unnecessary to survey a large sample of firms servicing the industry to gather quantitative data on the expenditure by these firms. It is sufficient to

interview key informants in a selection of firms to identify the types of issues that the cotton industry might wish to address. However, if precise numerical estimates of the aggregate flow-on and multiplier effects in firms servicing the cotton industry is required, then it will be necessary to take a larger and more rigorously selected sample of firms, with a corresponding increase in survey costs.

Figure 6.4.1 Possible timing of projects in the Monitoring, Understanding and Review sub-programs.

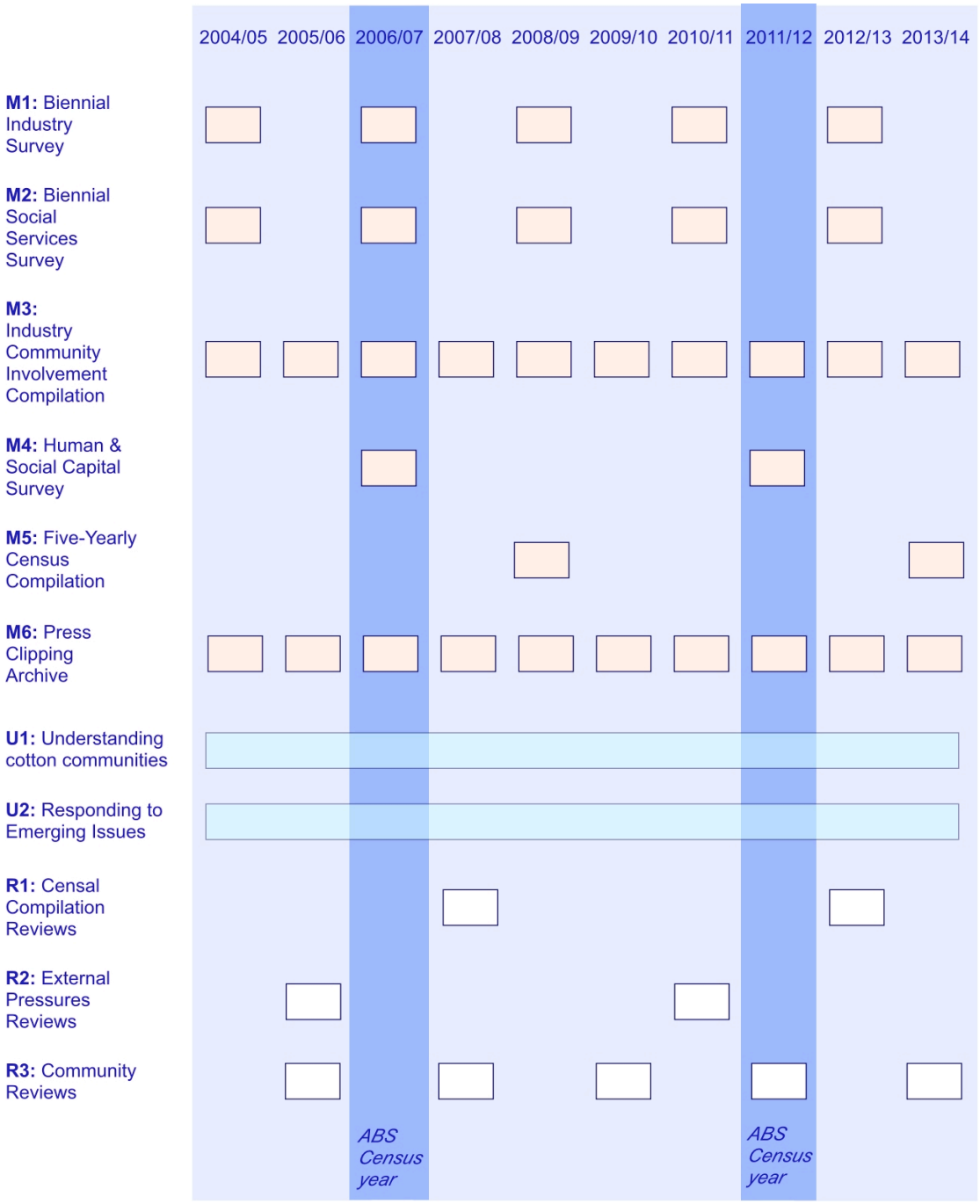


Table 6.4.1 Details for the biennial service industry survey

| | |
|---|---|
| **Method** | Out-sourced research. Face-to-face interview and/or telephone interview. Qualitative and quantitative data. |
| **Coverage and selection** | A sample of towns and cotton growing regions, based on the incidence of issues identified in the community reviews (R3). For each town or region, several firms from each service industry sector should be interviewed. For accurate industry-wide numerical estimates, a random sample of about 300 firms would be required across all the cotton growing regions. |
| **Content** | Changes in turnover and employment within the firm considered to be due to changes in the cotton industry. Information on the fate of employees leaving the firm (if there are declines in employment). Information on responses of the firms to changing conditions (e.g. developing new services to the cotton industry). |
| **Derived indicators for reporting** | Listing of issues identified by interviewees. Industry-wide numerical estimates would include employment and business turnover. |
| **Duration** | 6 months |
| **Indicative cost** | $15,000 per town and/or region ($30,000 p.a. assuming four regions) |

### *6.4.2. M2: Biennial social services survey*

The early detection of emerging social issues stemming from changes in the cotton industry requires an additional biennial survey to complement the biennial service industry survey. This survey would contact rural counsellors and other counselling services, welfare organisations, local government and State and Commonwealth social service providers to monitor on-going and emerging issues that may be affecting the social amenity and prosperity of the cotton growing regions. The survey would gather mainly qualitative information.

Table 6.4.2 Details for the biennial social services survey

| | |
|---|---|
| **Method** | Out-sourced research. Face-to-face interview and/or telephone interview. Largely qualitative data collected, with some quantitative data. |
| **Coverage and selection** | A sample of towns and cotton growing regions, based on the incidence of issues identified in the community reviews (R3). For each town and/or region, representatives from the organisations most likely to be familiar with the selected issues should be interviewed. |
| **Content** | The content of this survey will depend upon the nature of the issues identified in the community review. |
| **Derived indicators for reporting** | No aggregate numerical indicators as sample will be selected to span the range of issues, rather than to provide valid estimates for the whole industry. Listing of issues identified by interviewees. |
| **Duration** | 6 months |
| **Indicative cost** | $15,000 per town and/or region ($30,000 p.a. assuming four regions) |

### 6.4.3. M3: Industry community involvement compilation

The cotton industry undertakes a range of philanthropic and community involvement initiatives. As these initiatives may have direct effects on socio-economic issues being monitored in the M1 and M2 sub-programs, it is important to have a record of the nature of these initiatives and the resources devoted to them. Since some initiatives may not leave a permanent documentary record, this compilation should be undertaken annually so that key informants will be able to recall any initiatives undertaken in their area.

Table 6.4.3 Details for the annual industry community involvement compilation

| | |
|---|---|
| **Method** | Either in-house or out-sourced research. Snowball sampling starting with industry key informants. Telephone interviews. Largely qualitative data collected, with some quantitative data. |
| **Coverage and selection** | All cotton growing regions and towns therein. |
| **Content** | Information on scholarships funded directly by the industry, donations or other support for community groups, community programs initiated by the industry. |
| **Derived indicators for reporting** | Dollar value of scholarships, donations etc. Estimated dollar value of in-kind and other support. Number of people involved in community programs initiated by the industry. |
| **Duration** | 2 months |
| **Indicative cost** | $8,000 ($8,000 p.a.) |

### 6.4.4. M4: Human and social capital survey

The aim of this survey is twofold: to provide primary qualitative data to support the interpretation of indicators derived in the five-yearly Census compilation (M5), and to collect primary qualitative data on a small number of human and social capital indicators. Since change in these types of indicators is fairly gradual, the survey should be carried out at five year intervals. It should be carried out in Census years so that the primary qualitative data for interpretive purposes and the Census data pertain to the same point in time.

Table 6.4.4 Details for five-yearly human and social capital survey

| | |
|---|---|
| **Method** | Out-sourced research. Face-to-face interview and/or telephone interview. Qualitative data collected. |
| **Coverage and selection** | All cotton growing regions and towns therein. Some snowball sampling starting with key informants. The location of some interviewees (e.g. out-migrants from the cotton growing regions) may be time-consuming. |
| **Content** | In keeping with the twofold aim, there would be two areas of content. The first would include information on factors affecting in- and out-migration and changes in participation in formal and further education. The second would include information on changes reported by key informants in levels of participation in voluntary community service, in the effectiveness of community participation in natural resource management and in entrepreneurial business partnerships. |
| **Derived indicators for reporting** | Description of the nature of change in human and social capital in the cotton growing regions. No numerical indicators |
| **Duration** | 12 months |
| **Indicative cost** | $50,000 ($10,000 p.a.) |

### 6.4.5. M5: Five-yearly Census compilation

This sub-program would compile a range of socio-economic indicators from ABS Census data as it becomes available in the several years following each Census. The compilation would also include calculated inter-Censal changes for these indicators. Prior to undertaking the compilation, it would be appropriate to review the outputs of the other monitoring and research programs to identify any worthwhile additions to the compilation. As small area statistics are not available from ABS for up to two years after the Census is conducted, the five-yearly Census compilation should be planned to take place in the second year after the Census.

Table 6.4.5 Details for the five-yearly Census compilation

| | |
|---|---|
| **Method** | Out-sourced research. Desktop study using ABS Census data. |
| **Coverage and selection** | Low cost option: LGAs and towns covering all cotton growing regions. This is publicly available data.<br>Higher cost option: Purchase Basic Community Profile Data for aggregations of Collection Districts more closely matching all regions where cotton is grown. |
| **Content** | The compilation would include basic community profiles as set out in the tables in section 3.3 and age- and sex-specific employment, unemployment, net migration and qualification profiles. |
| **Derived indicators for reporting** | Numerical indicators as listed in the tables in section 3.3, together with tables of net migration, employment and unemployment levels and levels of qualifications by age and sex. |
| **Duration** | 6 months |
| **Indicative cost** | Low cost option: $20,000 ($4,000 p.a.)<br>Higher cost option $30,000 ($6,000 p.a.) |

### 6.4.6. M6: Press clipping archive

As mentioned in section 6.2.4, the interpretation of socio-economic indicators requires a readily accessible source of information about events affecting the cotton industry and regional economies and communities more generally. This is necessary to ensure that distinctions can be drawn between changes in rural communities that can be attributed to the cotton industry (and therefore might be the subject of remedial action by the industry itself), and changes that are occurring independent of the cotton industry. From details provided by the Murray Darling Basin Commission's Newscan service, the annual fixed costs for a similar service covering local papers in the cotton growing regions, the rural weeklies and the national dailies would be around $18,000. This cost could be reduced by up to several thousand dollars if weekly or monthly compilations were mailed to paying subscribers.

Table 6.4.6 Details for the press clipping archive

| | |
|---|---|
| **Method** | In-house or out-sourced research. Subscription to local newspapers in the cotton growing regions, and extraction and filing of relevant articles. |
| **Coverage and selection** | All cotton growing regions. |
| **Content** | Articles relating to the cotton industry and regional economies more generally |
| **Derived indicators for reporting** | No indicators routinely produced, although other sub-programs may wish to calculate indicators based on the press clipping archive, e.g. the number of articles per year about spraydrift issues. |
| **Duration** | Ongoing |
| **Indicative cost** | $18,000 p.a. assuming no subscribers. |

### 6.4.7. U1:Understanding cotton communities

This scoping study has identified a number of areas where there is need for improved understanding of the impacts of cotton industry trends on the prosperity and social amenity of the cotton growing regions. For example, a there is a need for collection of primary data to map the cotton industry's trade and social catchments. This information is essential if the understanding of impacts of the trends in the industry is to move beyond the scoping stage reported in this study. The U1 sub-program would fund qualitative and quantitative research in key areas where a greater depth of understanding is required to support the Monitoring sub-programs. Whereas most Monitoring sub-program projects would be of 12 months duration or less, projects in the Understanding sub-program might need to be several years in duration.

### 6.4.8. U2: Responding to emerging issues

As the cotton industry continues to respond to global and domestic pressures, it is likely that new service industries and new linkages between them and the cotton industry will emerge. These linkages, together with new pressures on the cotton industry, will result in new socio-economic issues emerging from time to time. There will be a need to develop an understanding of these issues to inform any responses the cotton industry might make. The purpose of the U2 sub-program would be to fund research projects that aim to improve the understanding of these emerging issues. The findings from this program would be used in periodic reviews of the Monitoring sub-programs.

### 6.4.9. R1: Censal compilation reviews

As mentioned in section 6.4.5, it will be necessary to review the findings of the Monitoring and Understanding sub-programs prior to undertaking the five-yearly Census compilations. The purpose of these reviews would be to identify any indicators that should be added to the compilation to cover emerging issues of interest. These reviews would also identify any indicators in the compilations which were not providing useful information. The Censal compilation reviews may be able to be conducted in-house by including evaluation sheets with published Census compilations and calling for submissions on additional indicators. If out-sourced, $10,000 should be budgeted for each Censal compilation review.

### 6.4.10. R2: External pressures reviews

Because of the fairly long lead times involved in commissioning and undertaking socio-economic research, and in formulating responses to issues identified by this research, it would be worthwhile undertaking reviews about every five years to identify emerging external pressures and trends within the industry that might have implications for the prosperity and social amenity of the cotton growing regions in the long term. This would enable guidelines for the U1 and U2 sub-programs to be adjusted in a timely manner. A cost effective approach to providing information for these reviews would be to schedule workshop sessions of several hours duration at industry conferences, with a view to bringing industry leaders together to elicit there views on emerging external pressures and trends within the industry. If the CRDC is providing funding for industry conferences, it might offer a small amount of additional funding to allow the organisers to schedule a short workshop session as described above. CRDC may be able to compile the findings from these workshops in-house, without the need to out-source the work to consultants or researchers. If out-sourced, and workshops were organised independent of industry conferences and findings compiled by an external consultant, an external pressures review could cost as much as $20,000, due to the need to cover travel and accommodation costs for participants.

### 6.4.11. R3: Community reviews

While many of the issues affecting the prosperity and social amenity of the cotton growing regions can be examined through the Monitoring and Understanding sub-programs, it is important that the community (including interest groups and industry organisations) be given the opportunity to provide their views on the issues that are of importance to them. The primary purpose of the R3 sub-program would be to present the findings of the socio-economic research and monitoring program to cotton growing communities. to encourage discussion and debate of the issues of concern in these communities, to receive community input on the program and to adjust the program as necessary. In

particular, the R3 sub-program would inform the choice of towns and/or regions selected for the biennial service industry and social services surveys.

Community reviews should be carried out by an independent organisation. Assuming two hour meetings with lunch or an evening meal supplied for participants, and meetings in 10 centres, together with travel for consultants and production of a report, each community review would cost around $20,000.

## 6.5. Priorities and costs

In establishing a program for monitoring key socio-economic indicators and providing the social component for CRDC's triple bottom line reporting, the sub-programs described in the preceding section have differing priorities. Priority refers to how important the sub-program is for the overall program.

Table 6.5.1 Priorities assigned to the sub-programs.

| Sub-program | Priority | Justification |
|---|---|---|
| M1: Biennial service industry survey | High | It is essential that the industry be aware of its impacts on service industries. |
| M2: Biennial social services survey | High | It is essential that the industry be aware of its impacts on communities in the cotton growing regions. |
| M3: Industry community involvement compilation | Medium | While this is important information for triple bottom line reporting, it is not essential for identifying impacts on communities to which the industry may wish to respond. |
| M4: Human and social capital survey | Medium | This sub-program provides supporting information to assist in the interpretation of the findings from the high priority sub-programs, but the latter can proceed and provide useful results in the absence of this sub-program. |
| M5: Five-yearly Census compilation | High | This sub-program provides high quality aggregate estimates for all cotton growing regions. |
| M6: Press clipping archive | High | This is a relatively low cost sub-program which, in addition to meeting CRDC's needs, could serve the industry more widely. |
| U1: Understanding cotton communities | Medium | This sub-programs involves relatively high cost basic research, and it is possible for the high priority sub-programs to proceed in its absence. |
| U2: Responding to emerging issues | Medium | This sub-programs involves relatively high cost basic research, and it is possible for the high priority sub-programs to proceed in its absence. |
| R1: Censal compilation review | Medium | The review is not absolutely essential to the five-yearly Censal compilation. |
| R2: External pressures reviews | Medium | The high priority sub-programs can proceed in the absence of this sub-programs. |
| R3: Community reviews | High | It is essential that the industry have a formal program of community consultation. |

The indicative costs of three options based on the priorities in Table 6.5.1 are shown in Table 6.5.2.

Table 6.5.2 Indicative costs for three options based on the priorities in Table 6.5.1. The timing of the surveys and reviews is as shown in Figure 6.4.1. No allowance has been made for inflation or program management.

*Low cost option:* only the high priority sub-programs, with the low cost option for M5 selected.

*Medium cost option:* the high priority sub-programs, $50,000 p.a. allocated to each of U1 and U2 sub-programs, and the low cost option for M5 selected.

*High cost option:* all the sub-programs, with $100,000 p.a. allocated to each of the U1 and U2 sub-programs, the high cost option for M5 selected, and assuming R2: external pressure review is out-sourced.

| Year | Low cost option | Medium cost option | High cost option |
|---|---|---|---|
| 2004/05 | $138,000 | $238,000 | $366,000 |
| 2005/06 | $38,000 | $138,000 | $246,000 |
| 2006/07 | $138,000 | $238,000 | $396,000 |
| 2007/08 | $38,000 | $138,000 | $256,000 |
| 2008/09 | $158,000 | $258,000 | $376,000 |
| 2009/10 | $38,000 | $138,000 | $266,000 |
| 2010/11 | $138,000 | $238,000 | $346,000 |
| 2011/12 | $38,000 | $138,000 | $296,000 |
| 2012/13 | $138,000 | $238,000 | $356,000 |
| 2013/14 | $58,000 | $158,000 | $276,000 |
| 2014/15 | $120,000 | $220,000 | $348,000 |
| **Average cost p.a.** | $92,000 | $192,000 | $318,000 |

In light of the possibility of decreased availability of research funds in the next several years due to the effect of the drought, it may be necessary to proceed with only the most essential of the sub-programs outlined above. The biennial service industry survey and the biennial social services survey are high priority research, but they could be readily combined into a single survey to achieve considerable savings. If this combined survey was restricted to a small number of cotton growing regions, the cost of the combined survey could be kept to about $30,000. Among the remaining sub-programs, the most important research need is for a better understanding of the extent of the trade catchments and social linkages associated with the cotton industry (U1). A project in this area, covering most of the cotton growing regions, could be completed in 12 months at a cost of around $40,000. By proceeding only with these three sub-programs, and combining two of them, it would be possible for CRDC to commence some social and economic indicator research on a budget of less than $50,000 p.a. (assuming the combined service industry and social services survey does not start in the same year as the U1 project on trade catchments and social linkages). The findings from this research would provide a reasonably detailed account of the impacts of the cotton industry on the economies of the cotton growing regions, including both benefits in terms of business and employment and issues that the industry may need to address.

### BOX 6: SUMMARY

Measurement of social and economic indicators in rural areas undergoing change has gained increasing interest in recent years. While, as yet, there is no 'standard' methodology, experience is being gained in a number of indicator projects around Australia. After describing some important considerations in choosing and interpreting social and economic indicators, the chapter sets out a range of indicators to assist the industry to contribute to viable regional communities that benefit from the profitability and sustainability of the cotton industry. These include:

- basic production indicators and indicators relating to the direct linkages between the industry and its service industries;
- human capital indicators that measure the stock of human capital, the movements of skills into, and out of, the cotton growing regions and the levels of employment of this capital;
- social capital indicators that provide surrogate measures of the ability of rural communities to adapt to change; and
- general rural indicators to provide information on broad long-terms trends that may be significant for strategic directions in the industry.

The chapter then provides a detailed description of a series of surveys and reviews, supported by basic research. These are divided into sub-programs and the timing of surveys and reviews, and the relationships between them is described. Indicative program costings are also provided, ranging from $92,000 p.a. for a low cost option, to $318,000 p.a. for a high cost option. By focussing on just three sub-programs, and combining two of them, it would be possible for CRDC to commence social and economic indicator research with a budget of less than $50,000 p.a.

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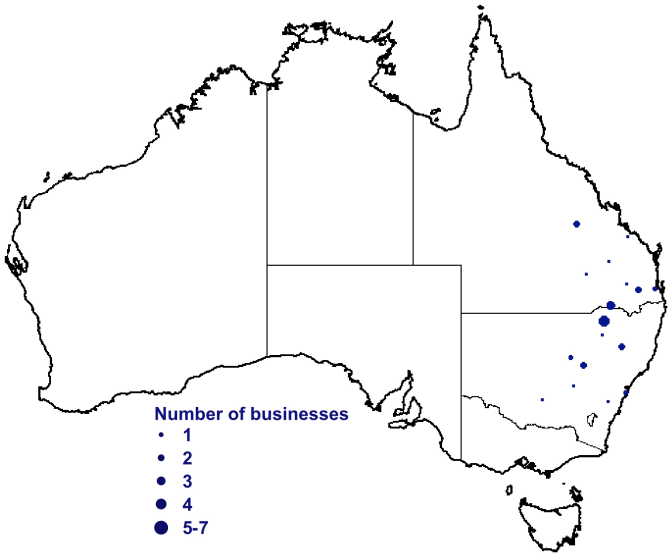
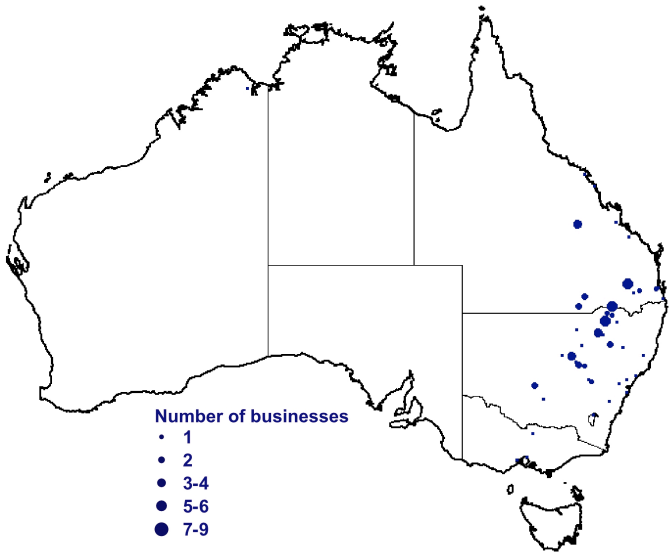
# APPENDIX 1

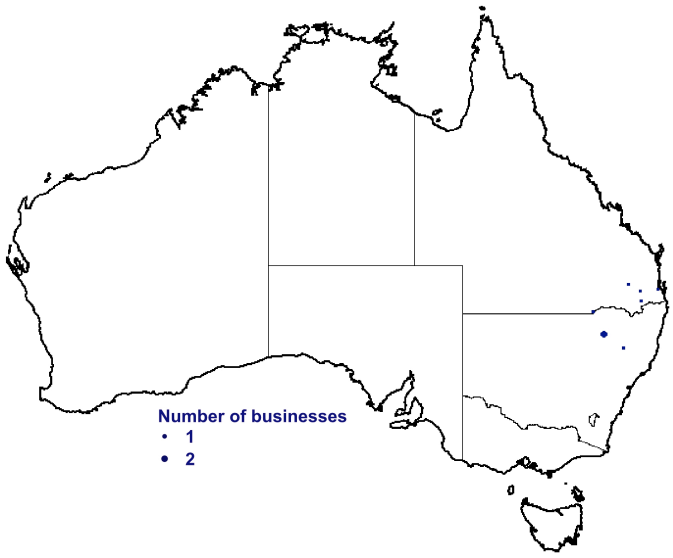
Location of accountants, financial institutions, insurers, solicitors and real estate agents servicing the cotton industry.



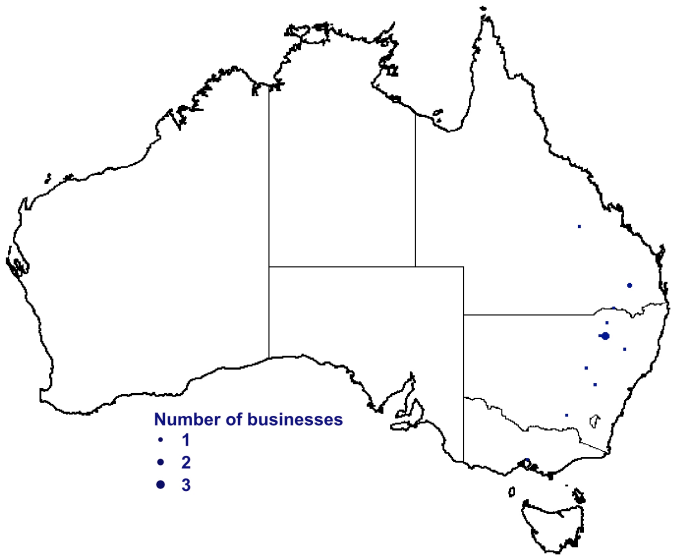

Location of chemical companies, aerial operators and firms supplying agricultural chemicals and fertilisers to the cotton industry.



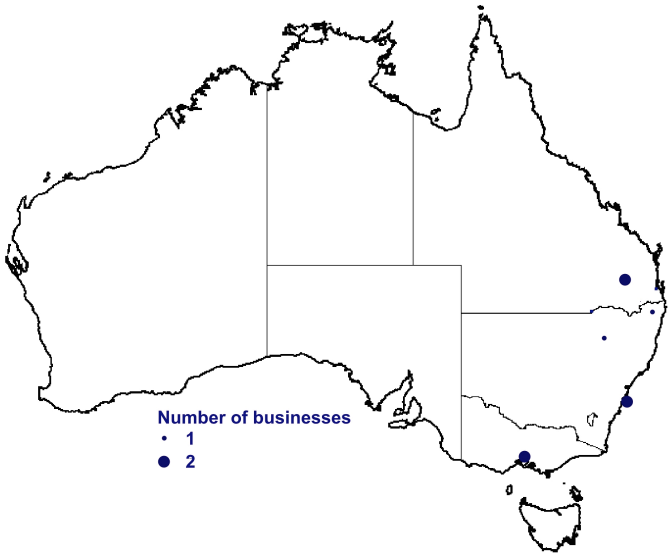
Location of firms supplying agricultural electronics, precision farming, soil and plant tissue testing and agronomic and environmental services to the cotton industry.




Location of biotechnology and seed supply firms.



Location of shipping, handling and transport firms with linkages to the cotton industry



# APPENDIX 2

Mr Phil John, Peel Valley Machinery, Narrabri
Mr Ian McCallum, General Manager, Narrabri Shire Council
Mr Neil Derwent, Rates Maager, Narrabri Shire Council
Mr John Dunnet, Editor, The Courier, Narrabri
Cr Robyn Keeffe, Councillor, Narrabri Shire Council
Mr Phil Armytage, Cotton Grower Services, Wee Waa
Mr Stefan Henggeler, Auscott, Narrabri
Mr Bruce Gunning, Bruce Gunning & Associates, Moree
Mr Peter Mahaffy, Surveyor, Wee Waa
Mr David Owen and Mr Graham Bayliss, McInnes Processing, Narrabri
Ms Jayne O'Connor, Weil Bros Cotton, Narrabri
Mr Max Cook, Harpers Grain & Storage, Narrabri
Ms Roslyn Laws, Narrabri & District Community Aid Service
Mr Kevin Humphreys, Chair, New England & Northwest Area Consultative Committee.
Mr Craig Copping, Canzac Pulse Processing, Narrabri.
Mr Tony Duncan, P & O (transport), Narrabri
Mr Colin Barnes, BNB Engineering, Narrabri
Mr Don Webb, Cargill, Narrabri
Mr Morris Simshauser, Cramsie McRae Wesfarmers, Narrabri
Mr Michael Carberry, cotton producer, Narrabri
Manager, Pursehouse Rural, Gunnedah
Mr Phillip Fulwood, Elders, Gunnedah
Manager, Gough and Gilmour, Gunnedah
Mrs Lyn Gollan, Gollan's Transport, Gunnedah
Mr Darryl Campbell, Revenue Manager, Gunnedah Shire Council, Gunnedah
Mr Chris Ryan, Economic Development Officer, Gunnedah Shire, Gunnedah
Mr Chris Lehman, cotton consultant, Edgeroi
Jon-Maree Baker, Executive Officer, Cotton Consultants Australia, Narrabri
Mr Keith Whiteman, Rural Financial Counsellor, Walgett
Mr Vic North, General Manager, Walgett Shire Council, Walgett
Mr Fiona Tier, Rural Financial Counsellor, Walgett
Mr David Black and Ms Julie Black, Aircair Aviation, Moree
Mr Paul Assef, Assefs, Moree
Mr Bruce Gunning, Gunning and Associates, President, Water Exhange, Moree
Mr Edward Pitt, Aboriginal Employment Strategy, Moree
Mr Dick Estens, Aboriginal Employment Strategy and cotton producer, Moree
Mr Nick Barton, Twynam Pastoral Co., Moree
Staff of the Cotton Interpretative Centre
Three meetings of cotton growers held to discuss changes to ground-water sharing rules in the Namoi Valley were attended and discussions held with a number of cotton growers, consultants, and other industry stakeholders.