Fitzroy Natural Resource Management Region:

Grazing Sector

Key Points

- The grazing sector contributed 67% of the gross value of agricultural commodities in Fitzroy in 2010-11.
- The sector employed 3.2% of the labour force or 69.2% of the agricultural workforce.
- Characteristics of the sector that potentially **decrease** its vulnerability to the impacts of climate change include relatively low levels of socio-economic disadvantage within the populations in which the grazing sector is an employer.
- Characteristics of the sector that potentially **increase** its vulnerability to the impacts of climate change include 1) its location in areas classified as 'remote Australia' where access to services is generally poorer than less remote areas; 2) its occurrence within local economies that are very specialised with fewer alternative employment options; and 3) the older age profile of the sector's workforce.

Introduction

This brochure focuses upon the grazing sector in Fitzroy Natural Resource Management Region (NRMR). It has been prepared as part of a top-down socio-economic vulnerability assessment to the impacts of climate change based upon freely available, national data sets from the Australian Bureau of Statistics (ABS). The classifications used by the ABS to report data from the 'Census of Population and Housing 2011' and the 'Agricultural Census 2010-11' make it difficult to separate completely the grazing sector from other agricultural sectors. This is especially the case with employment data that includes 'mixed livestock-cropping' classifications. Similarly, in the case of data for the value of agricultural commodities produced, it is impossible to separate completely the contribution of the beef cattle grazing sector from other grazing sectors (e.g., dairy). All data is presented in a way that makes clear which agricultural sectors are included. It is recommended that the brochure be read and interpreted in the context of more detailed knowledge of local circumstances.

Brief Sector Profile

Grazing is the dominant land use by area in Fitzroy. In 2010-11, 91% (13 million hectares) of all land was used for grazing purposes. The grazing sector is dominated by cattle grazing. In 2010-11, the value of all cattle slaughterings and disposals (beef & dairy) was $672 million, 98% of all livestock slaughterings and disposals from the region. The value of milk products was $5 million. Combined, the value of the beef cattle and dairy grazing sub-sectors contributed 67% of the total value of agricultural commodities produced in Fitzroy (Figure 1).

There were 3,230 cattle grazing establishments, almost all of which (3,219) were solely or partly beef cattle enterprises. Collectively, beef cattle enterprises in Fitzroy farmed 2.7 million cattle in 2010-11.

In 2011, 3,653 persons were employed in the beef cattle grazing sector which represented 3.2% of the total Fitzroy labour force or 69.2% of the total Fitzroy agricultural workforce. A further 428 persons (8%) were employed in the mixed livestock-cropping sector, and 118 persons (2%) were employed in other livestock sectors (e.g., sheep, beef feedlots, dairy) (Figure 2).

When the beef cattle grazing sector workforce is categorised by type of employment, 43% were owner managers, 29% were employees and 28% were family members contributing to a business.

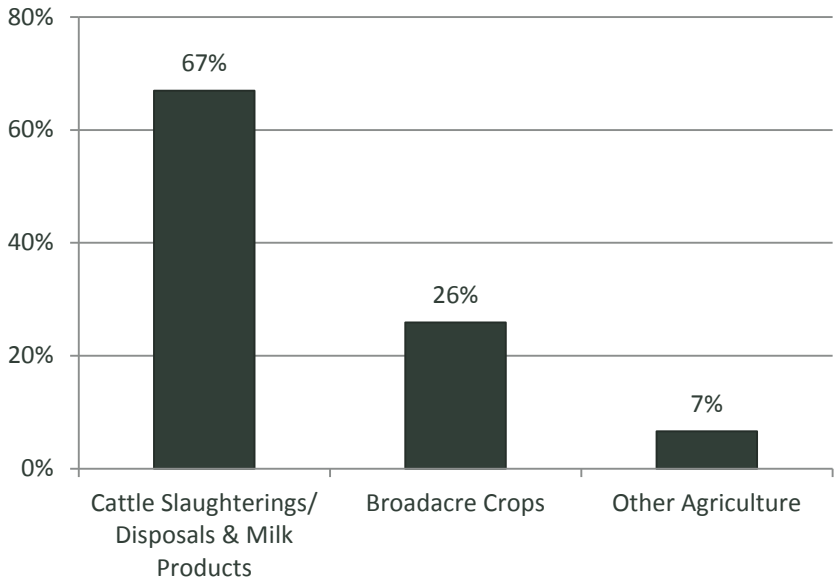

Figure 1: % of gross value of agricultural commodities produced 2010-11

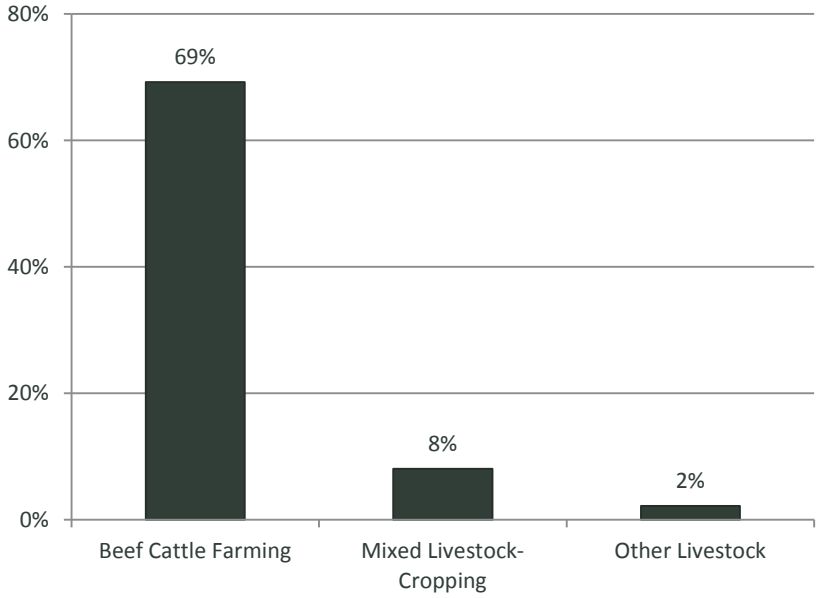

Figure 2: % of grazing workforce resident in Fitzroy

Geographic Remoteness

Rural and regional areas are often characterised by higher levels of disadvantage than urban areas because of the interaction between socio-economic characteristics of the population and the characteristics of particular places.[7] For example, following the natural disasters in Queensland in 2010-11, higher proportions of people living in rural and remote areas reported suffering adverse impacts when compared to people living in larger urban areas.[5] Similarly, more negative social impacts of drought were experienced in rural areas that had experienced a reduction in the level of services when compared to areas where service provision was more stable.[8]

The measure used here is the Australian Bureau of Statistics' 'Remoteness Structure' which divides Australia into five areas based upon relative access to services by measuring the physical road distance between populated localities and the nearest service centres. There are five categories: Major Cities of Australia, Inner Regional Australia, Outer Regional Australia, Remote Australia, and Very Remote Australia.[9]

In 2011, the Fitzroy population was concentrated in 'inner regional Australia' and 'outer regional Australia' (91%). The remaining 9% lived in more remote areas.

Unsurprisingly, the beef cattle workforce lived in more remote areas than the wider population. More than half of the beef cattle workforce resided in 'remote Australia' or 'very remote Australia' (58%), and 33% lived in 'outer regional Australia' (Figure 3).

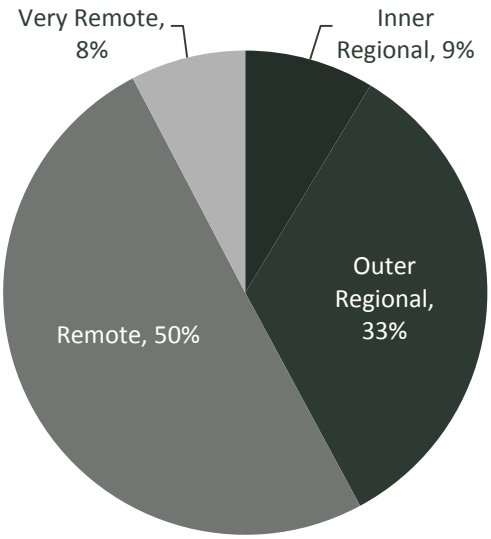

Figure 3: Geographic remoteness of grazing workforce

Significance of Agriculture

Sensitivity to the impacts of climate change has been associated with the degree to which a population is dependent upon natural resources.[1, 2] Populations dependent upon economic sectors that are characterised as being highly resource dependent may be highly sensitive to climatic variability. Agriculture, broadly defined, is highly dependent upon natural resources; thus, populations in which agriculture is socially and economically significant may be more vulnerable to downturns in one or more agricultural sectors. One way to assess the significance of agriculture to a given population is to consider the percentage of the labour force that is employed in the sector.

In 2011, 4.6% of the labour force resident in Fitzroy was employed in agriculture but this varied across the region. The percentage of the labour force was calculated for 36 statistical areas that intersect with the Fitzroy NRMR boundary in which the labour force was greater than 100 persons. The percentage of the labour force employed in agriculture ranged from 0.0% to 34.5%. In 12 of these areas, more than 4.6% of the labour force was employed in agriculture; in 16 areas less than 1.0% of the labour force was employed in agriculture. The populations in which the social significance of agriculture is high are located in central and southern Fitzroy. These populations are typically characterised by more than 40% of the resident labour force being employed in agriculture. The percentage of the labour force employed in agriculture increased in a south-westerly pattern. North-eastern areas surrounding Rockhampton were characterised by less than 20% of the labour force employed in agriculture; in the south-western areas more than 40% of the labour force was employed in agriculture. The predominance of the grazing sector in Fitzroy agriculture means that the percentage of the labour force employed in grazing reflected the pattern of the wider agricultural sector.

Socio-Economic Advantage & Disadvantage

As mentioned above, the role remoteness plays in socio-economic vulnerability to the impacts of climate change intersects with other socio-economic characteristics. In general, populations with higher levels of socio-economic disadvantage may have reduced capacity to respond to climatic and environmental changes.[5, 10]

The indicator used here is the Australian Bureau of Statistics' 'Index of Relative Socio-Economic Advantage & Disadvantage' (IRSAD) which is a measure of people's "access to material and social resources, and their ability to participate in society".[11] The index is derived from a range of data collected in the 'Census of Population and Housing'. Geographic areas are assigned a decile from 1-10. A low decile indicates a high proportion of relatively disadvantaged people in an area. A high decile indicates that an area has a relatively low incidence of disadvantage.

In 2011, more than two-thirds of statistical areas in Fitzroy scored between 3 and 8, indicating moderate levels of socio-economic disadvantage. When compared to the IRSAD deciles for Australia, a slightly lower percentage of areas in Fitzroy were categorised as having very high levels of disadvantage

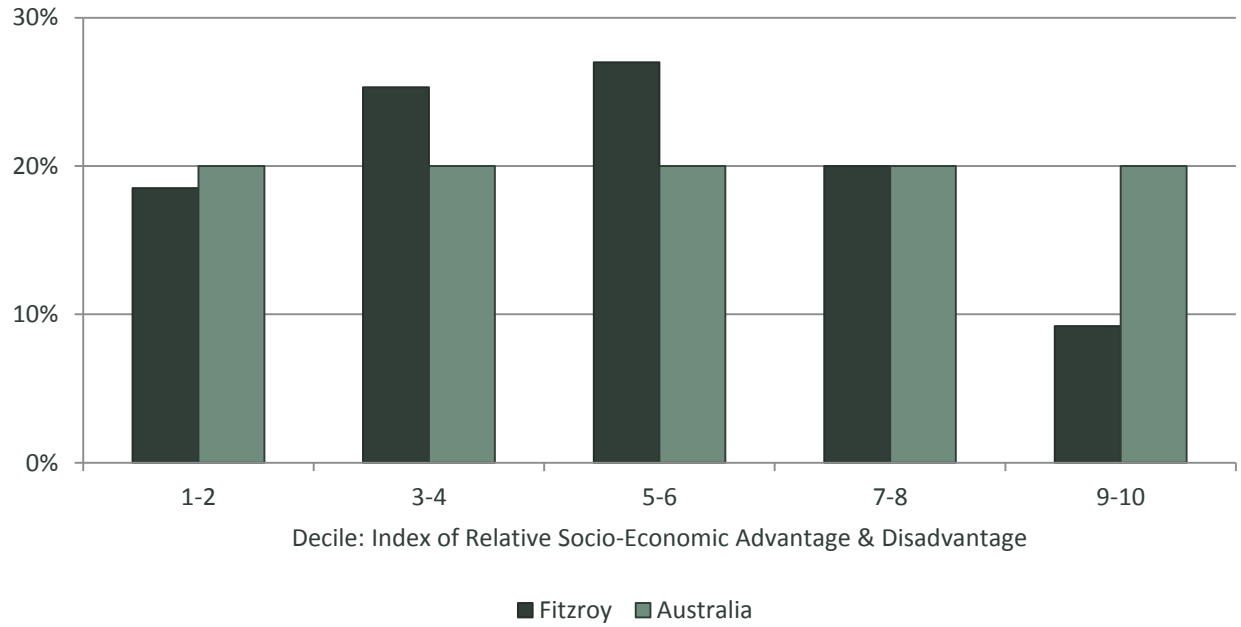

Figure 4: Percentage of statistical areas (SA1) in Fitzroy by IRSAD decile

(deciles 1-2). However, a much lower percentage (9%) of Fitzroy areas had very low levels of disadvantage (deciles 9-10) when compared to Australia (Figure 4). Populations with low IRSAD deciles (1-4), indicating a high proportion of disadvantaged people, were concentrated in the east of the region. In west Fitzroy, there were comparatively low levels of disadvantage. These populations with higher IRSAD deciles (5-10) overlapped with the populations in which the grazing sector employed a higher percentage of the labour force, particularly in the south-west of the region.

Economic Diversity

A diverse economy may contribute toward reduced socio-economic vulnerability because it provides a broader range of employment opportunities if individual sectors experience a downturn due to economic or environmental factors. For example, a study of farming and small communities in the Murray-Darling Basin revealed that widespread negative social impacts tended to be experienced more acutely in areas that were almost totally reliant on agricultural sectors, with almost no alternative avenues of employment.[8]

The indicator used here is the Hachman Index, a measure of how closely the employment distribution of Fitzroy resembles the employment distribution of the wider Australian economy. Scores range from 0-1, where the economic diversity of the Australian economy is considered to be equal to 1.00.

The Hachman Index for Fitzroy is 0.41 meaning that the economy is more specialised than Australia as a whole. In 2011, all sectors of the economy were represented, but the top five sectors comprised half of the region's employment (51.4%). The mining sector contributed 17.1% of total employment, while the agricultural sector was the ninth highest contributing sector (6.0% of employment compared to 2.5% for the Australian economy).

Within Fitzroy there was spatial differentiation. The Hachman Index was calculated for 39 statistical areas that intersect with the Fitzroy boundary. Using 0.90 as representative of a diversified economy,[12] none of the areas were diversified. Five (13%) areas had a score above 0.75, which represent the urban areas of Emerald, Gladstone, Yeppon, and parts of Rockhampton.

The southern and western areas of Fitzroy that contributed most to the gross value of beef cattle production in 2010-11 had very specialised economies represented by Hachman scores of 0.20 or lower, suggesting that they might be more vulnerable to a downturn in the sector.

Figure 5: Percentage of grazing workforce by age

Age

Age is one of the most common socio-economic variables to be associated with vulnerability to climate change impacts. In general, much of this research focuses upon the increased sensitivity of older populations to negative health impacts of changes to the climate[3] or their reduced capacity to respond to stressors.[4] However, the direction of the association between age and vulnerability to climate change is not straight-forward. For example, a survey of 6,104 Queensland residents after the flood and cyclone events of 2010-11, revealed that adults of working age were more likely to report exposure to property damage, reduced incomes, and adverse emotional impacts. The researchers of this study suggested that this is because people of working age have a greater likelihood of being employed, owning income producing property, and having dependent children.[5] Similarly, in an agricultural context, other researchers report that both older- and younger-aged cattle producers can demonstrate similarly low levels of vulnerability to climate change impacts because of other intervening factors (e.g., strength of industry networks and willingness to make changes).[6]

In the Fitzroy beef cattle sector, a slightly higher percentage (20%) of the workforce was 65 years or older when compared to the wider Fitzroy agricultural workforce (18% were 65 years or older). In general, the beef cattle sector workforce is older than the mixed livestock-cropping workforce. (Figure 5 shows the age distribution for the wider agricultural sector and the grazing sector).

When considering those beef cattle sector workers who have decision-making responsibility, a higher percentage of owner managers were 65 years or older (24%), and almost half (49%) of owner managers were 55 years or older. In comparison, 22% of owner managers in the agricultural sector as a whole were 65 years or older.

Summary

The following table summarises the indicators presented and the typical way in which they are interpreted concerning socio-economic vulnerability to the impacts of climate change.

Table 1: Indicators for assessing potential socio-economic vulnerability

Variable	Categories or Scores	Interpretation
Significance of Agriculture	Percentage of labour force employed in agriculture	A higher percentage of the labour force employed in agriculture indicates a population/region in which agriculture is more significant than populations/regions in which a lower percentage of the labour force is employed in agriculture. Higher significance of agriculture suggests higher levels of resource dependency and, therefore, higher sensitivity to the impacts of climate change.
Age	1. 15-24 years 2. 25-34 years 3. 35-44 years 4. 45-54 years 5. 55-64 years 6. 65 years or older	Older aged people are often more sensitive to climate change impacts (e.g., increases in temperature) and often have lower levels of adaptive capacity. This combination suggests potentially higher levels of vulnerability.
Geographic Remoteness	1. Major Cities of Australia 2. Inner Regional Australia 3. Outer Regional Australia 4. Remote Australia 5. Very Remote Australia	Larger distances from service centres are suggestive of higher vulnerability.
Socio-Economic Advantage & Disadvantage	Deciles between 1 and 10	Deciles closer to 10 indicate a lower proportion of disadvantaged people which is suggestive of higher levels of adaptive capacity, and therefore potentially lower levels of vulnerability.
Economic Diversity	Scores between 0 and 1	Scores closer to 1 indicate a more diverse economy which is suggestive of lower levels of vulnerability.

Data Sources

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Further Information

This Fact Sheet should be referenced as:

Smith E, Keys N, Lieske S & Smith T, 2014, *Fitzroy Natural Resource Management Region: Grazing Sector*, prepared as part of the East Coast NRM Cluster, University of the Sunshine Coast, Sippy Downs, Queensland, Australia.

This Fact Sheet forms part of the activities of the East Coast NRM Cluster. This project aims to foster and support an effective "community of practice" for climate adaptation within the East Coast Cluster regions that will increase the capacity for adaptation to climate and ocean change through enhancements in knowledge and skills and through the establishment of long term collaborations. The East Coast Cluster consists of the coastal Natural Resource Management (NRM) bodies in Queensland and New South Wales between Rockhampton and Sydney. The Research Consortium comprises: University of Queensland (Consortium leader); Griffith University; University of Sunshine Coast; CSIRO; University of Wollongong; New South Wales Office of Environment and Heritage; and Queensland Department of Science, IT, Innovation and the Arts (Queensland Herbarium). The views expressed herein are not necessarily the views of the consortium partners, and the consortium partners do not accept responsibility for any information or advice contained herein. The East Coast NRM Cluster received funding from the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education as part of the Natural Resource Management Climate Change Impacts and Adaptation Research Grants Program, under the Natural Resource Management Planning for Climate Change Fund - A Clean Energy Future Initiative. The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.

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