Northern Rivers Natural Resource Management Region: Grazing Sector

Key Points

- The grazing sector contributed 50% of the gross value of agricultural commodities in Northern Rivers in 2010-11.
- The grazing sector employed 2.2% of the labour force or 54.8% of the agricultural workforce.
- Characteristics of the grazing sector that potentially **decrease** its vulnerability to the impacts of climate change include 1) relatively low levels of socio-economic disadvantage within the south-west populations in which the grazing sector is an employer; and 2) the young age profile of the dairy sector workforce when compared to the wider agricultural workforce.
- Characteristics of the sector that potentially **increase** its vulnerability to the impacts of climate change are 1) relatively high levels of socio-economic disadvantage within the north-west grazing areas; 2) its location in areas classified as 'outer regional Australia' where access to services is poorer than less remote areas; 3) its occurrence within specialised local economies with fewer alternative employment options; and 4) the older age profile of the beef cattle sector when compared to the wider agricultural workforce.

Introduction

This brochure focuses upon the grazing sector in Northern Rivers 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 Northern Rivers. In 2010-11, 84% (1.8 million hectares) of all land was used for grazing purposes. Cattle grazing dominated the sector. In 2010-11, the value of cattle slaughterings and disposals (beef & dairy) was $286 million, 76% of the total value of livestock slaughterings and disposals from the region. The value of milk products was $97 million (76% of the total value of livestock products). The value of sheep slaughterings and disposals was $23 million (6% of all livestock slaughterings & disposals) and the value of wool produced was $27 million (21% of total livestock products). Combined, the value of the beef cattle, dairy cattle and sheep grazing sub-sectors contributed 50% of the total value of agricultural commodities produced in Northern Rivers (Figure 1).

There were 5,652 cattle grazing establishments, almost all of which (5,484) were solely or partly beef cattle enterprises. Collectively, beef cattle enterprises farmed 880,000 cattle in 2010-11. The same year, there were approximately 60,000 dairy cattle across 368 farm establishments and 1.1 million sheep across 781 farm establishments.

In 2011, 4,857 persons were employed in the grazing sector which represented 55% of the total agricultural workforce. Figure 2 shows the distribution of the grazing sector workforce across five grazing subsectors. The beef cattle grazing sector employed 3,340 persons (69% of all persons in the grazing sector). The dairying sector employed 664 persons (14%); 470 persons were employed in mixed sheep-beef enterprises (10%), and the sheep grazing sector employed 282 persons (6%). A further 101

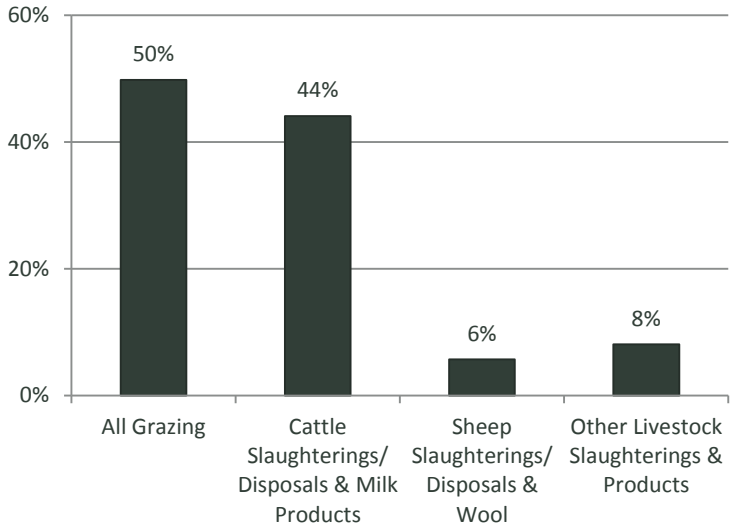

Figure 1: % of gross value of agricultural commodities produced 2010-11

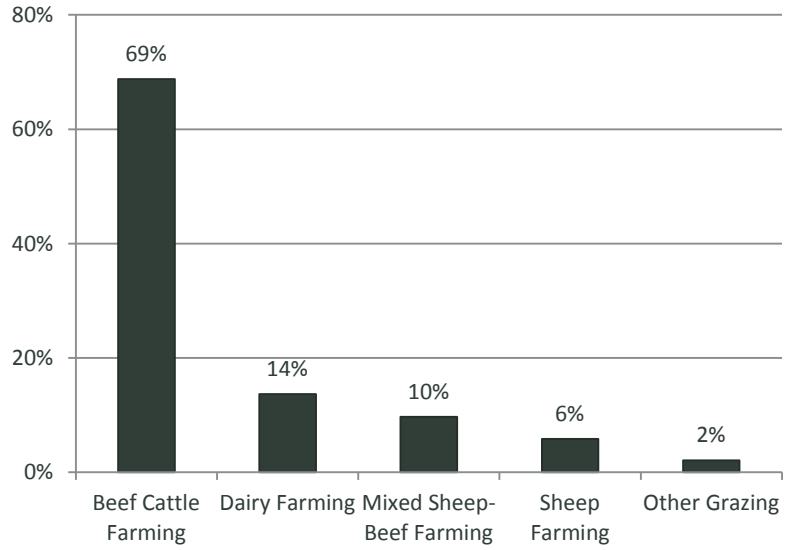

Figure 2: % of grazing workforce resident in Northern Rivers

persons (2%) were employed in enterprises that included grazing activities in their operations (e.g., sheep-grain, beef-grain).

In the grazing sector workforce, 48% were owner managers, 21% were employees and 30% were family members contributing to a business.

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 areas that had experienced a reduction in the level of services when compared to rural 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, 59% of the grazing workforce resided in 'outer regional Australia'; and 40% of the workforce lived in areas categorised as 'inner regional Australia' (Figure 3). Unsurprisingly, the wider Northern Rivers population was more concentrated in areas categorised as 'inner regional Australia' (73%), with only 14% located in 'outer regional Australia'. The remaining 13% resided in urban areas categorised as 'major cities'.

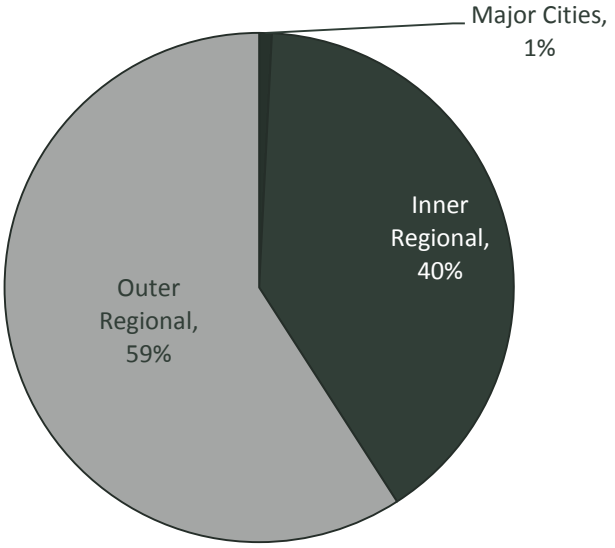

Figure 3: Geographic remoteness of grazing workforce

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, 4.1% of the labour force resident in Northern Rivers was employed in agriculture but this varied across the region. The percentage of the labour force was calculated for 51 statistical areas that intersect with the Northern Rivers NRMR boundary in which the labour force was greater than 100 persons. The percentage of the labour force employed in agriculture ranged from 0.4% to 39.8%. In 20 of these areas, more than 4.1% of the labour force was employed in agriculture; in seven areas less than 1.0% of the labour force was employed in agriculture. The populations in which the social significance of agriculture was high were located along the western border of Northern Rivers. These populations were typically characterised by more than 20% of the labour force employed in agriculture. In the far south west of the region, the percentage of the labour force employed in agriculture was more than 60%. The percentage of the labour force employed in the grazing sector 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, two-thirds of statistical areas in Northern Rivers had a high proportion of disadvantaged people (deciles 1-4). When compared to the IRSAD deciles for Australia, a lower percentage of areas had high IRSAD deciles, indicating that relatively few areas had low proportions of disadvantaged people (Figure 4). Populations with low IRSAD deciles (1-4), indicating a high proportion of disadvantaged people, were concentrated throughout central Northern Rivers.

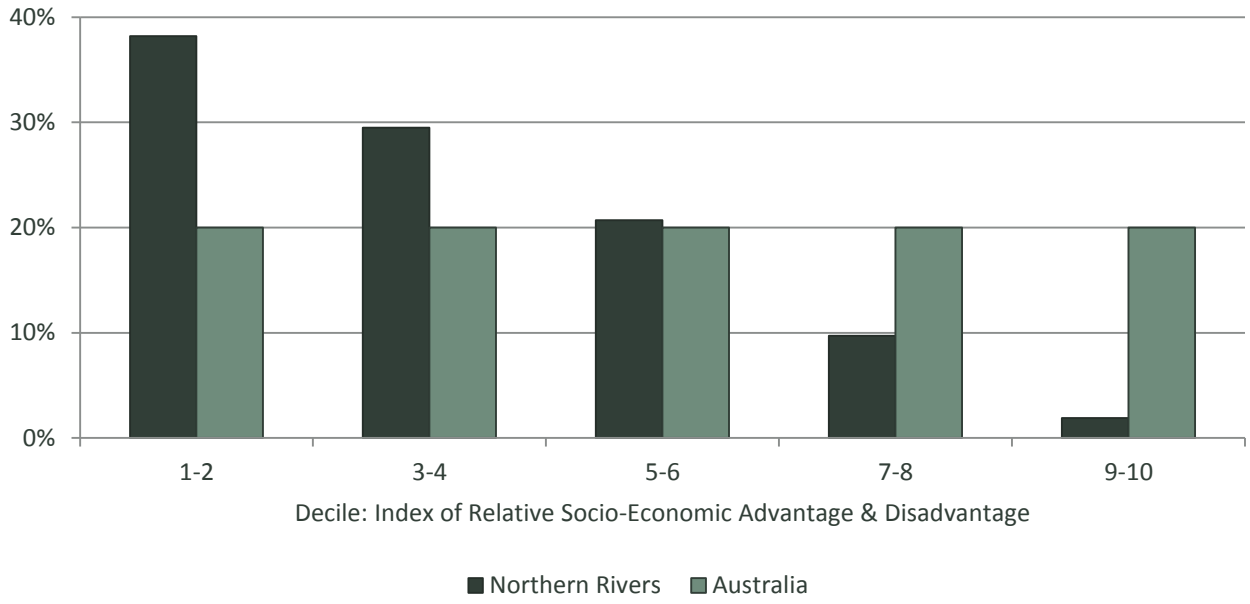

Figure 4: Percentage of statistical areas (SA1) in Northern Rivers by IRSAD decile

Populations with lower levels of disadvantage (deciles 5-10) were clustered around Byron Bay/Lismore and Port Macquarie, as well as, in the south-west around Armidale. The south-western populations with higher IRSAD deciles (5-10) overlapped the areas in which the grazing sector employed a higher percentage of the labour force. The grazing regions in the north-west of the region were characterised by relatively high levels of socio-economic disadvantage (deciles 1-4).

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 Northern Rivers resembles the employment distribution of the wider Australian economy. Scores range from 0.00-1.00, where the economic diversity of the Australian economy is considered to be equal to 1.00.

The Hachman Index for Northern Rivers is 0.86 meaning that the economy is diverse but less diversified than Australia. In 2011, all sectors of the economy were represented, but the top four sectors comprised half of the region's employment (50.0%). The health and retail sectors contributed 30.0% of total employment (compared to 22.6% for the Australian economy). The agricultural sector was the seventh highest contributing sector (6.1% of employment compared to 2.5% for the Australian economy).

Within Northern Rivers there was spatial differentiation. The Hachman Index was calculated for 51 statistical areas that intersect with the Northern Rivers boundary. Using 0.90 as representative of a diversified economy,[12] none of the areas were diversified. Eighteen (35%) areas scored above 0.75, which represent the urban areas of Grafton, Ballina, Lismore, Kempsey, Casino, and parts of Tweed Heads and Coffs Harbour/Sawtell. Smaller urban centres such as Bellingen, Urunga, Murwillumbah, Mullumbimby/Brunswick Heads,

Scotts Head, Wauchope, Laurieton, Evans Head and its surrounds also had reasonably diverse economies.

The south-western areas of Northern Rivers that contributed most to the gross value of grazing production in 2010-11 had very specialised economies (scores 0.20 or lower), suggesting that they might be particularly vulnerable to downturns in the grazing sector. The grazing areas in the north-west of the region had slightly more diverse economies (scores 0.21-0.50).

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 2011, 29% of the Northern Rivers grazing sector was 65 years or older, a slightly higher percentage than the wider Northern Rivers agricultural workforce (22% were 65 years or older). In the case of beef cattle farmers, 34% of the workforce were 65 years or older. The dairy sector's workforce had a younger age profile with only 13% who were 65 years or older. (Figure 5 shows the age distribution for the wider agricultural sector and the grazing sector).

When considering those grazing sector workers who have decision-making responsibility, a higher percentage were over 65 years of age (34%), and almost two-thirds (64%) of owner managers were 55 years or older. Consistent with the differences between the age profiles of sub-sectors, owner managers in the dairy sector (19% were 65 years or older) were younger than their counterparts in the beef cattle grazing sector (38% were 65 years or older).

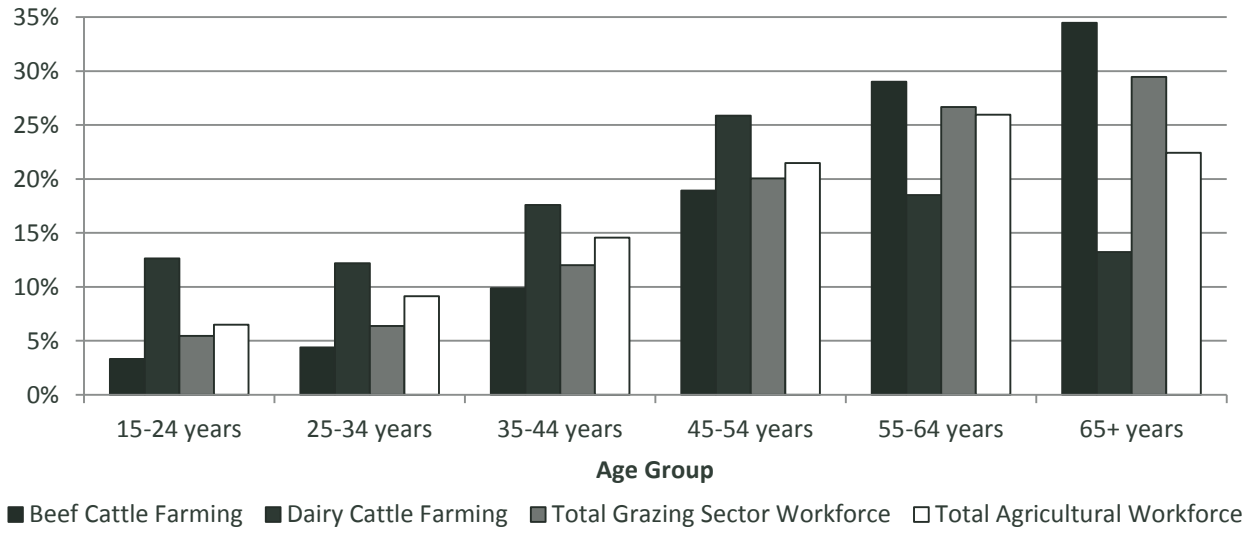

Figure 5: Percentage of grazing workforce by age

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:

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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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