South East Queensland Natural Resource Management Region: Horticultural Sector

Key Points

- The horticultural sector contributed 54% of the gross value of agricultural commodities in South East Queensland in 2010-11.
- The sector employed 0.3% of the labour force or 46.3% of the agricultural workforce.
- Characteristics of the sector that potentially **decrease** its vulnerability to the impacts of climate change include 1) its location in areas classified as 'major cities of Australia' and 'inner regional Australia' where there is good access to services; and 2) the young age profile of the total workforce and the sector's owner managers.
- Characteristics of the sector that potentially **increase** its vulnerability to the impacts of climate change include 1) its occurrence in more specialised local economies with fewer alternative employment options; and 2) its location within populations characterised by high to moderate levels of socio-economic disadvantage.

Introduction

This brochure focuses upon the horticultural sector in South East Queensland 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). Sub-sector classifications (i.e., Nursery & Floriculture Production, Vegetable Growing, and Fruit & Tree Nut Growing) are derived from the ABS classifications used to report data from the 'Census of Population and Housing 2011' and the 'Agricultural Census 2010-11'. It is recommended that the brochure be read and interpreted in the context of more detailed knowledge of local circumstances.

Brief Sector Profile

In 2011, the horticultural sector employed 4,758 persons, which represented 0.3% of the total South East Queensland labour force or 46.3% of the total South East Queensland agricultural workforce.

The sector comprised three sub-sectors:

- Nursery & Floriculture Production
- Vegetable Growing
- Fruit & Tree Nut Growing

The Vegetable Growing sector employed the largest percentage of the horticultural workforce (41%); 38% were employed in the Fruit & Tree Nut Growing sector, and the remaining 21% were employed in the Nursery & Floriculture Production sector (Figure 1). Two-thirds of the workforce comprised employees (66%). Owner managers of horticultural businesses comprised 26% of the workforce, and 7% were family members contributing to a business.

Combined, these three sub-sectors contributed $656 million (54%) of the gross value of agricultural production in South East Queensland in 2010-11. The Vegetable Growing sector contributed more than half of the value of horticultural production (52%; $341 million), the Nursery & Floriculture Production sector contributed $185 million (28%) and the Fruit & Tree Nut Growing sector contributed 20% ($130 million)

(Figure 2). A wide range of vegetables contributed to the value of agricultural production produced by the Vegetable Growing sector including lettuce ($38 million), beans ($36 million), mushrooms ($30 million), and vegetables not specifically identified in the Agricultural Census data ($108 million). In the Fruit & Tree Nut Growing sector, berry production contributed 55% ($71 million) of the value of commodities produced. Half (51%; $94 million) of the value of commodities produced by the Nursery & Floriculture sector came from nurseries, a further 37% was contributed by cultivated turf ($69 million). The remaining 12% came from cut flower production ($21 million).

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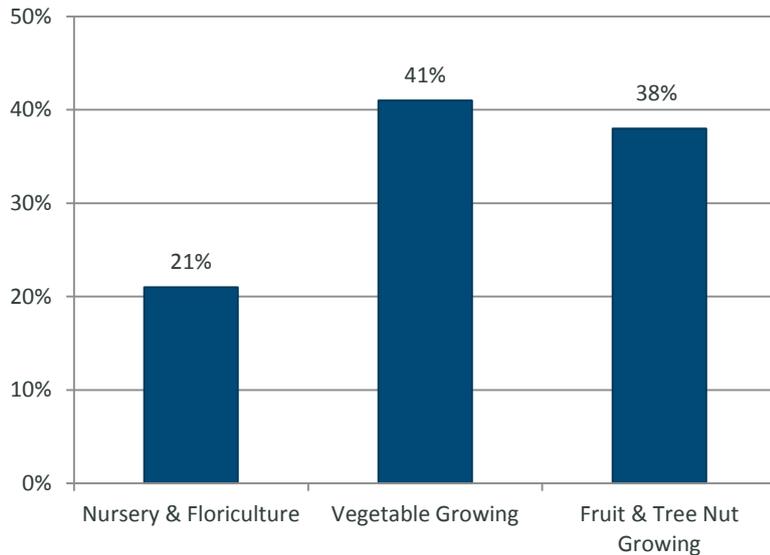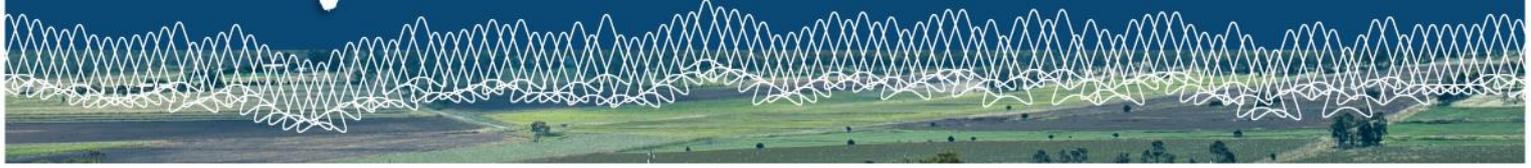
Figure 1: % of horticultural workforce resident in South East Queensland
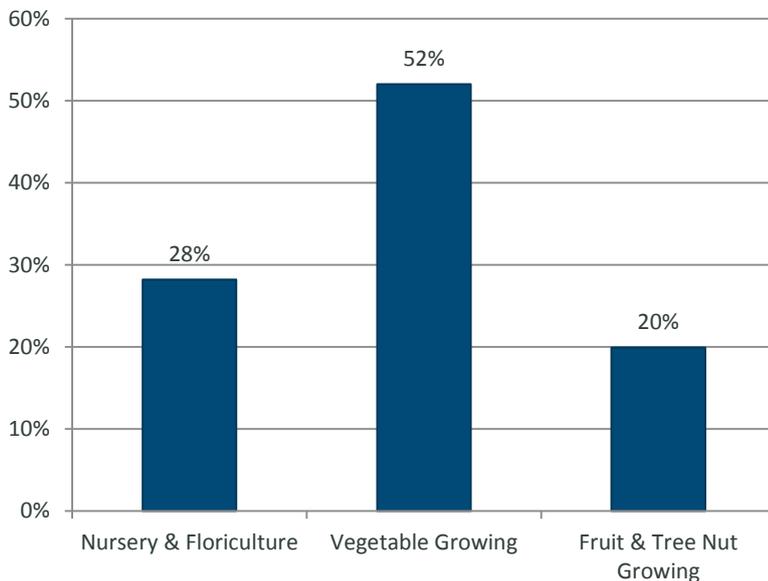
*Figure 2: % of gross value of horticultural commodities produced 2010-11*

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]

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In 2011, 51% of the horticultural workforce lived in areas classified as 'major cities', 49% of the workforce resided in areas classified as 'inner regional Australia', and 1% lived in 'outer regional Australia'. Unsurprisingly, the wider South East Queensland population was concentrated in 'major cities' (92%). The remaining 8% lived in 'inner regional Australia' (Figure 3).

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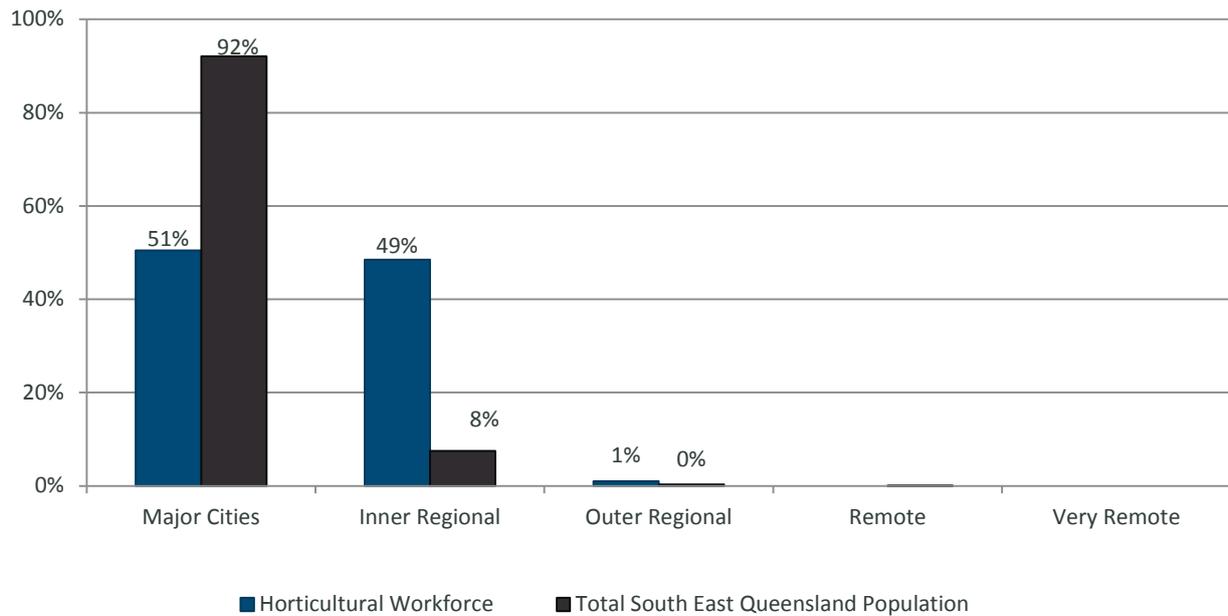
Figure 3: Geographic remoteness

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, 0.7% of the South East Queensland labour force was employed in agriculture but this varied across the region. The percentage of the labour force was calculated for 313 statistical areas in which the labour force was greater than 100 persons. The percentage of the labour force employed in agriculture ranged from 0.0% to 25.2%. In 51 of these areas, more than 0.7% of the labour force was employed in agriculture.

Unsurprisingly, the percentage of the labour force employed in agriculture increased as the distance from Brisbane increased. More than 20% of the labour force was employed in agriculture in the north-western, western and southern areas of the region. A small area between Caboolture and Beerwah also had a high percentage of the labour force employed in agriculture. The percentage of the labour force employed in horticulture revealed a similar pattern. With the exception of some small areas in the north-east of the region, the percentage of the labour force employed in horticulture was rarely equal to the percentage of the labour force employed in agriculture, suggesting that the South East Queensland horticultural sector co-exists with other agricultural sectors.

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)

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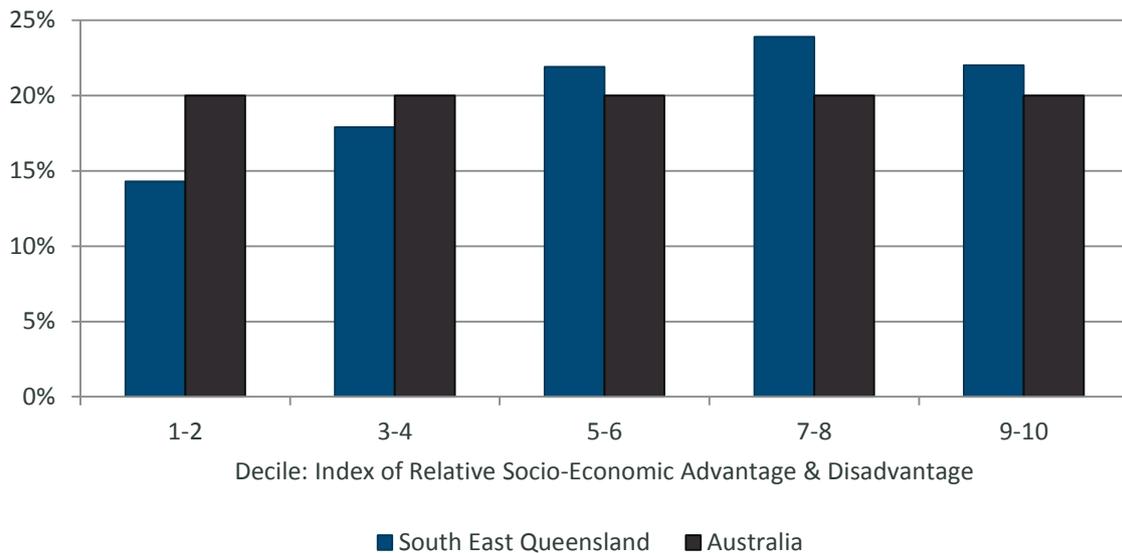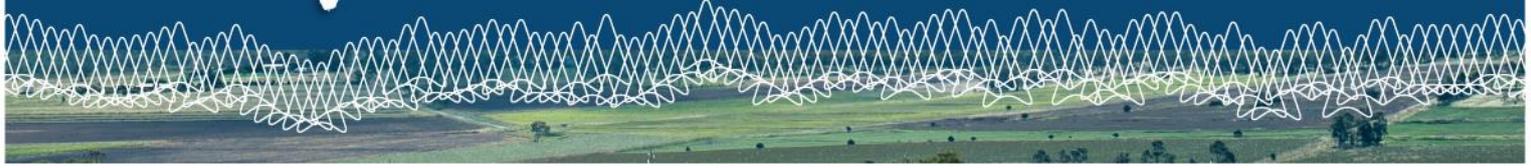
Figure 4: Percentage of statistical areas (SA1) in South East Queensland by IRSAD decile

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 score indicates that an area has a relatively low incidence of disadvantage.

When compared to the IRSAD decile distribution for Australia, the distribution in South East Queensland was slightly skewed toward high deciles that indicate relatively low levels of socio-economic disadvantage. Consequently, a slightly lower percentage of areas (32%) in the region had low IRSAD scores when compared to Australia (40%) (Figure 4). Unsurprisingly, areas with lower proportions of disadvantaged people (deciles 7-10) are clustered around Brisbane, parts of the Gold

Coast, and to a lesser extent the Sunshine Coast and Toowoomba. Areas with higher levels of disadvantage (deciles 1-6) are concentrated in the central-west and southern areas of the region. These areas typically correspond to the areas in which there is a higher percentage of the labour force employed in the horticultural sector.

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 South East Queensland 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 South East Queensland is 0.98 meaning that the diversity of the economy is comparable to the wider Australian economy. In 2011, all sectors of the economy were represented, but the top five sectors comprised half of the region's employment (50.1%). The retail and health sectors contributed 24.4% of total employment (compared to 22.6% for the Australian economy). The agricultural sector was the eighteenth highest contributing sector (0.9% of employment compared to 2.5% for the Australian economy).

Within South East Queensland there was spatial differentiation.

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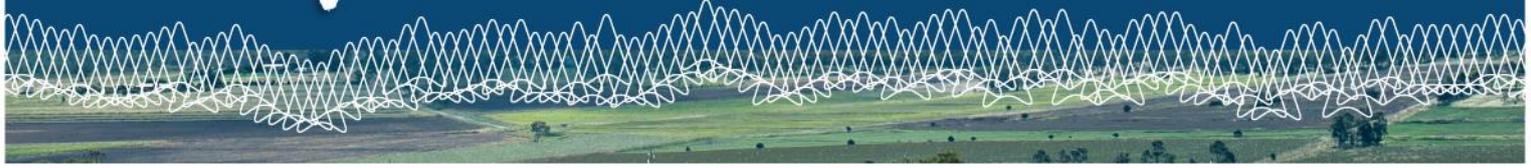
The Hachman Index was calculated for 321 statistical areas that intersect with the South East Queensland NRMR boundary. Using 0.90 as representative of a diversified economy,[12] none of the statistical areas were diversified. Thirty-three (10%) areas had a score above 0.75. Six of these areas were in Brisbane City. The other areas with the most diversified economies were Samford Valley, Nerang, Jimboomba, Springwood, and parts of the Sunshine Coast.

In 2010-11, the areas that contributed most to the gross value of horticultural production were in the south-west of the region where local economies tended to be more specialised (scores between 0.21 and 0.40), suggesting that they might be more vulnerable to downturns in one or more of the horticultural sub-sectors. Horticultural areas in Lockyer Valley East and Lowood were characterised by more diverse economies.

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 South East Queensland horticultural sector, 8% of the workforce was aged 65 years or older compared to 15% for the total agricultural sector. There were differences between the age distributions of each sub-sector. The Fruit & Tree Nut Growing sector had the largest percentage of the workforce aged 65 years or older (11%). In comparison, 5% of the Vegetable Growing sector workforce and 6% of the Nursery & Floriculture sector workforce were aged 65 years or older. (Figure 5 shows the age distribution for the horticultural sector and each of the sub-sectors).

When considering horticultural workers who have decision-making responsibility, a slightly higher percentage of owner managers were aged 65 years or older (13%). In comparison, 24% of owner managers in the agricultural sector as a whole were 65 years or older. Owner managers in the Fruit & Tree Nut Growing sector (22% were aged 65 years or older) were older than their counterparts in the Nursery & Floriculture sector (7% were aged 65 years or older), and the Vegetable Growing sector (10% were aged 65 years or older).
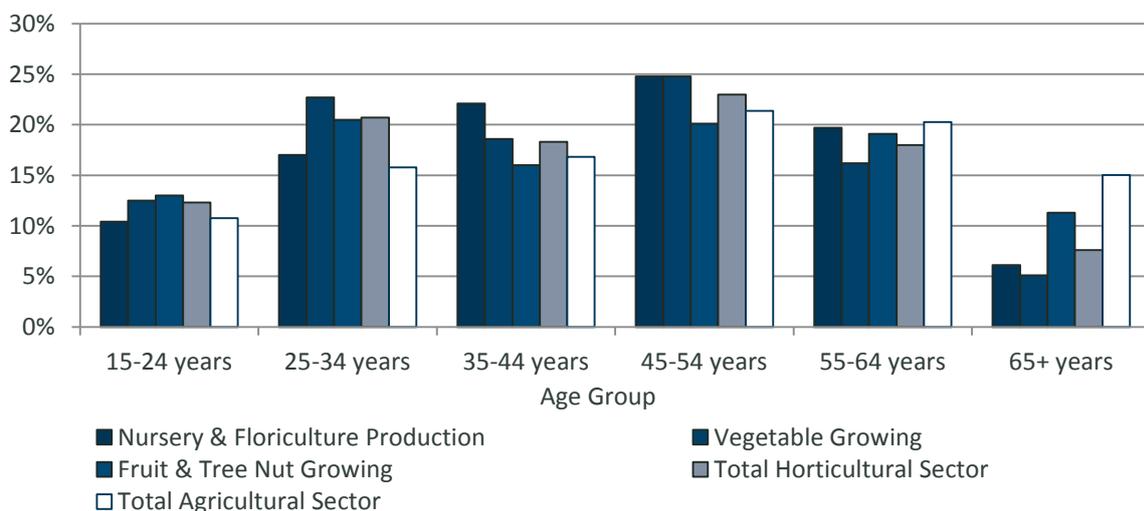

Figure 5: Percentage of horticultural workforce by age
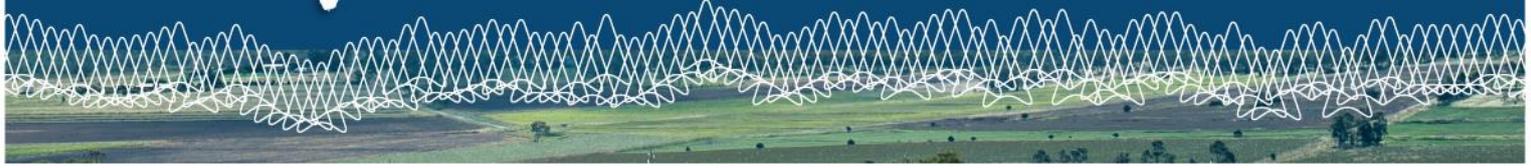
Summary

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.
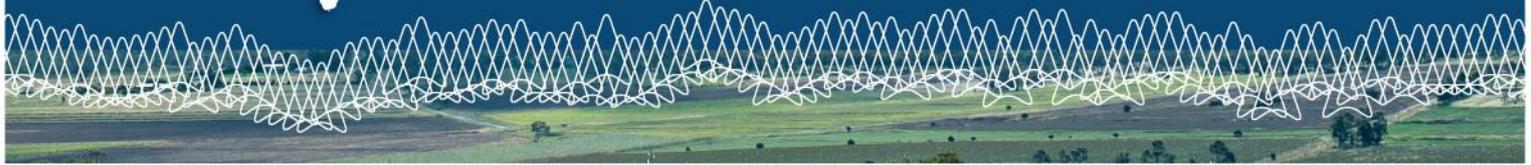
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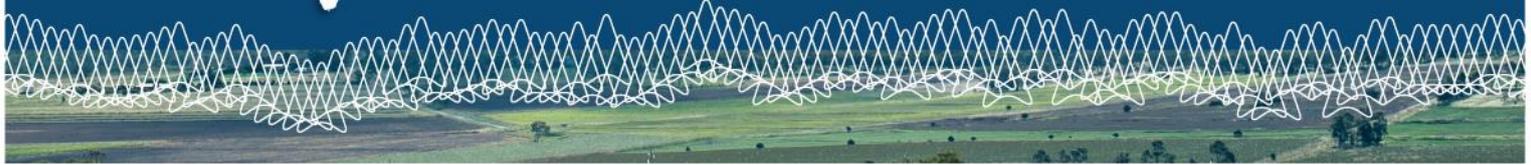
Further Information

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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,

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