KEY INDUSTRIES IN AUSTRALIA'S TROPICAL SAVANNA

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ABSTRACT: Covering approximately one quarter of mainland Australia, the Tropical Savanna (TS) is home to fewer than 3 percent of all Australians. Yet it accounts for close to 30 percent of the nation's exports and contains more than 70 percent of Australia's freshwater resources. Not surprisingly, there is considerable interest in the region's potential for further economic growth and a consequent need for information about the socio-economic structure of its communities. This paper uses data from the Australian Bureau of Statistics and from a survey of more than 900 organisations in the TS, to identify and describe key industries of the region. It demonstrates that communities in the TS – particularly those in remote and very remote parts – are NOT just 'smaller versions' of larger, Australian communities. Their economic structure differs, sometimes significantly, from that of Australia as a whole. And the economic structure of some communities, often differ significantly from those that adjoin them.

1. INTRODUCTION

Covering an area of more than 1.9 million square kilometres, the Tropical Savanna (TS) region includes eight general geographic regions: the Kimberley, Darwin-Kakadu, VRD-Sturt, Arnhem Land, the Gulf Country, the Mitchell grasslands, Cape York and North East Queensland. Its vegetation is largely comprised of wooded grasslands and it has a warm, tropical climate with pronounced wet and dry seasons.

Despite the fact that the region covers approximately 25 percent of Australia's mainland, it is home to only 3 percent of all Australians – a little more than 604,000 people (Stoeckl and Stanley, 2004). Most of the TS region is therefore sparsely populated. Notwithstanding this, the region accounts for around 30 percent of the nation's exports and has contributed to over one third of Australia's export growth in the past 30 years (Greiner et al 2004). Evidently, there is much potential – and much interest – in the economic growth and development of Northern Australia (Chapman et al, 1996; Land and Water Australia 2005).

As noted by Jackson and Murphy (2006), however, employment in the regionally based industries of Agriculture and Mining declined from 5.7 percent of the total workforce to 4.9 percent between 1991 and 2001. In contrast, employment in tourism-related fields increased from 5.8 percent to 7.3 percent of the workforce over that same period. Clearly, the economic structure of many communities within regional Australia is undergoing significant change and one

cannot assume that the future pattern of economic growth and development will simply follow patterns from the past (even if one thought those patterns were desirable ones to follow).
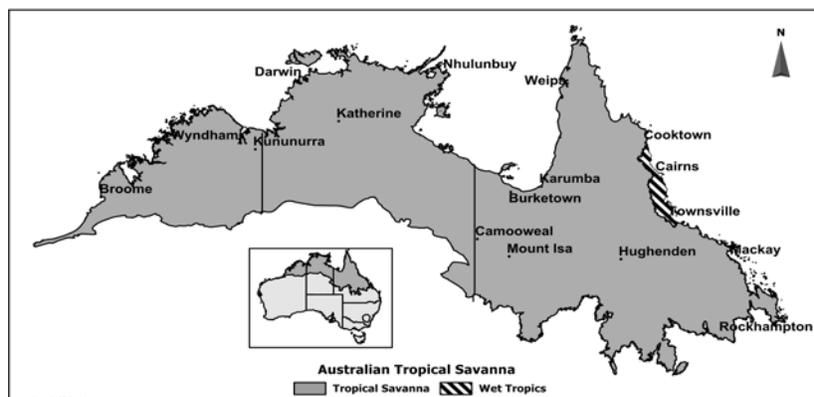
Figure 1. Australia's Tropical Savanna

Furthermore, communities of the TS differ from that of Australia as a whole in many ways, including, but not limited to, population density, population growth rates, remoteness, and ethnicity. So one cannot help but wonder whether data that has been collected and aggregated across relatively large regions (e.g. for states or territories) will adequately describe what is happening within its component parts and whether models which use regionally aggregated data sets will be able to produce results that are meaningful to small communities.

Most postcodes within the TS, for example, are geographically large and contain few people (Figure 2). Consequently, population densities in the TS are generally much lower than that of Australia as a whole (Figure 3) – for the most part, there are fewer than 0.2 persons per square kilometre. Notable exceptions occur in and around the towns of Darwin, Katherine, the Atherton tablelands, and other communities along the southern coastal strip of the TS.

Perhaps not surprisingly, most postcodes within the TS are classified as "very remote", having an ARIA+ (Accessibility / Remoteness Index of Australia) of more than 10.43. Specifically, the ARIA indexes are derived from measures of road distance between populated localities and service centres. These road distance measures are then used to generate a remoteness indicator between 0 (most accessible) and 15 (most remote). Any region with an ARIA+ greater than 10.43 is considered to be very remote (GISCA, 2006) – and this is the case for most of the geographic area of the TS.

Unlike many other Australian communities, a relatively large proportion of the TS residents are of Aboriginal or Torres Strait Islander descent (ATSI). In the 2001 census, only 2.1 percent of Australia's population identified themselves as being of ATSI descent – yet as shown in Figure 4, ATSI people comprise

more than 25 percent of the population of most postcodes across the TS.
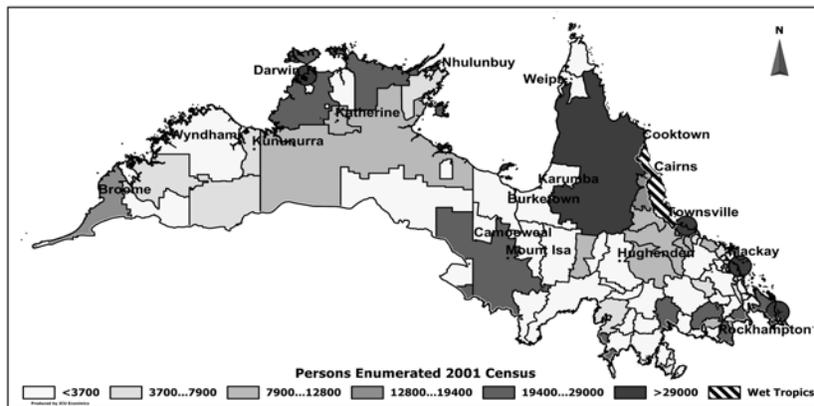
Source: Data obtained from ABS CDATA 2001

Figure 2. Population – enumerated persons by postcode
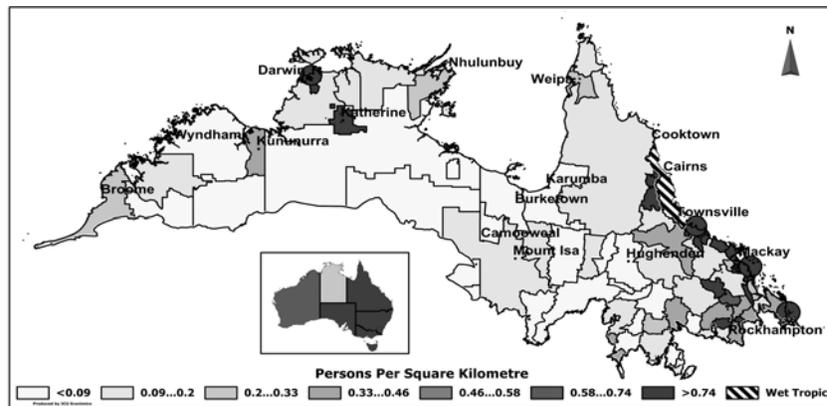
Source: Data obtained from ABS CDATA 2001

Figure 3. Persons per Square Kilometre – by postcode

The relatively high proportion of ATSI people in the TS may at least partially account for the relatively high population growth rates in these areas – the fertility rate of Indigenous people is higher than for non-Indigenous people (ABS, 2006a). Despite rumours of rural population decline across Australia as a whole, there are some areas within the TS region where populations have been

rising relatively rapidly. This is particularly true of the north and western regions of the TS (Figure 5).
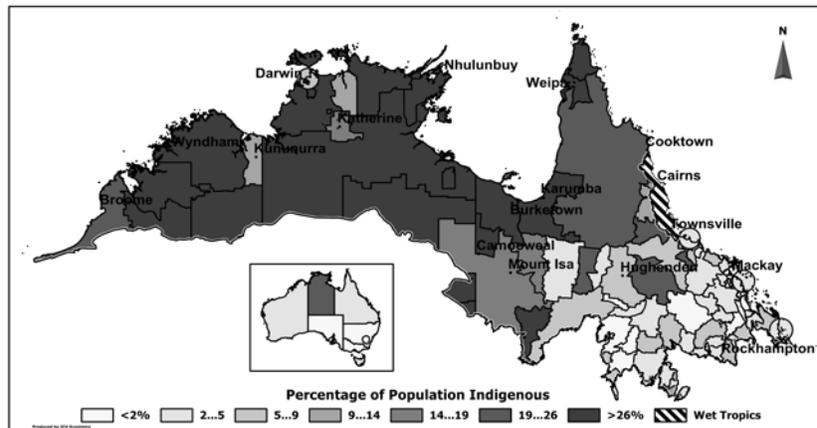
Source: Data obtained from ABS CDATA 2001

Figure 4. Percent of Population ATSI – by postcode
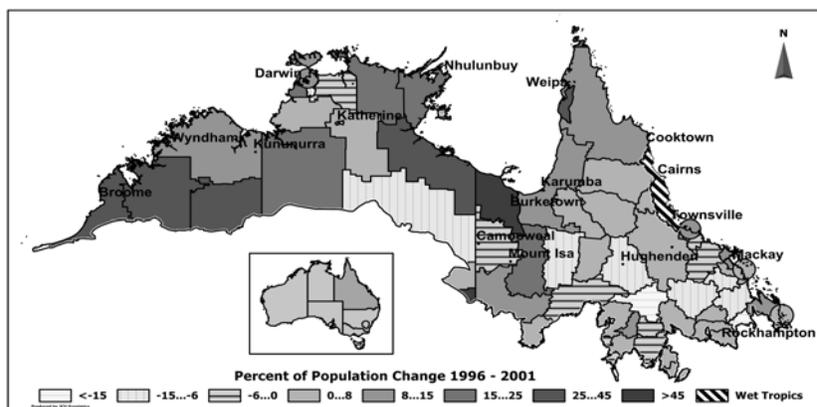
Source: Data obtained from ABS CDATA 2001

Figure 5. Percentage change in the number of persons enumerated in between the 1996 and 2001 – by SLA

The relatively high proportion of Indigenous persons within the TS may also partially explain the relatively low labour force participation rates that are

apparent, since the Indigenous population of this area is known to have low participation rates (Commonwealth of Australia, 2005). As shown in Figure 6, large parts of the Northern Territory, and parts of north-western Western Australia have labour force participation rates (measured as the percentage of population in the workforce) that are considerably less than other Australian state averages. In contrast, labour force participation rates in some parts of the TS (notably, those around Weipa and the inland areas near Mackay) are much higher than the average participation rates in other Australian states.
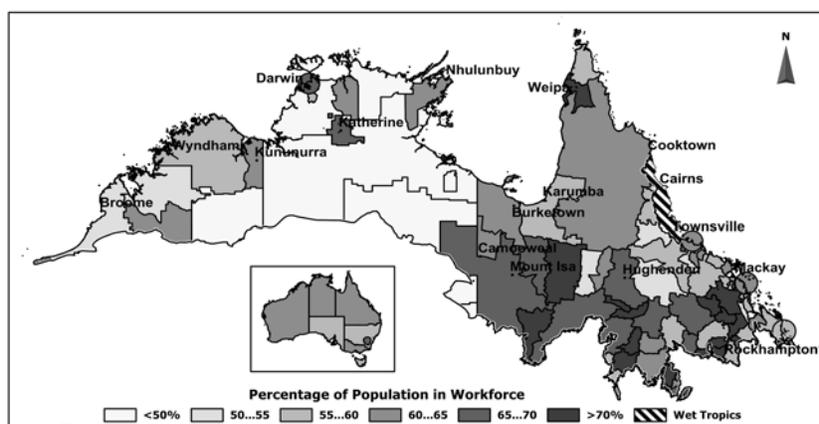
Source: Data obtained from ABS CDATA 2001

Figure 6. Percentage of Population in Workforce – by postcode

Interestingly, the 2001 Census data also indicates that many remote parts of the TS (most particularly in Western Australia, the Northern Territory excluding Darwin, and Cape York) have a relatively high percentage of the workforce employed part-time, compared to the Australian states. As can be seen in Figure 7 there are some postcodes within the TS region where more than 50 percent of the workforce is employed part-time.

Whilst this contrasts with the Australian average of 30 percent of the workforce employed part-time and the NT average of 29 percent of the workforce employed part-time, it accords with findings of the Commonwealth of Australia (2005, p 11.13) who report that Indigenous persons living in "very remote" and "remote" parts of Australia are more likely to work part-time than those in larger centres (these may be mainly CDEP workers who do not work a full 38 hour week). It also seems that remote workers of the TS region are less likely to be employed in 'white-collar' jobs (i.e. as professionals, para-professionals or managers) than their urban counterparts (Figure 8).
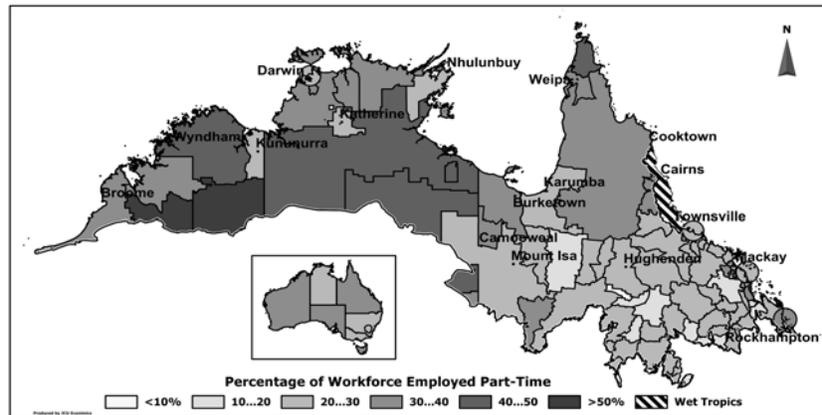
Source: Data obtained from ABS CDATA 2001

Figure 7. Percentage of workforce employed part-time – by postcode
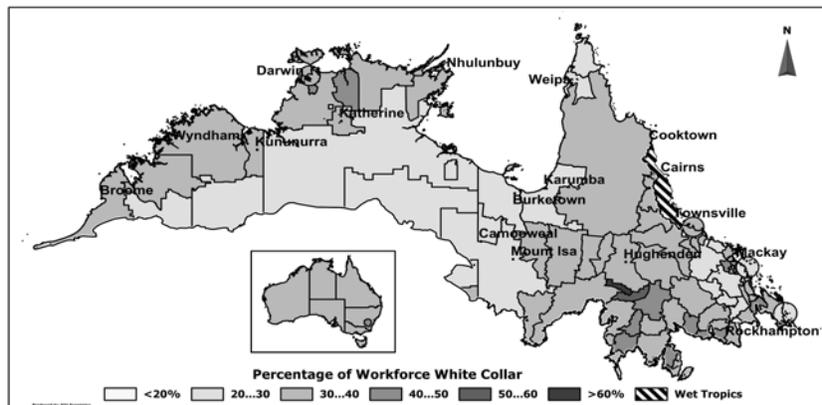
Source: Data obtained from ABS CDATA 2001

Figure 8. Percent of workforce in 'white collar' jobs – by postcode

Given the relatively low labour force participation rates, the relatively high rates of part-time work and the prevalence of 'blue-collar' jobs in the remote parts of the TS, it is not surprising to also find that household incomes in these remote areas are generally less than those of Australia's southern states (Figure 9). Notable exceptions occur in and around some of the large mining communities (eg near Mackay/Rockhampton, Weipa, Mt Isa, Jabiru and

Kununurra). A similar story is obtained if one examines the distribution of individual incomes across the TS. As highlighted by Freebairn (2003), there are both advantaged, and disadvantaged Australians throughout the country.
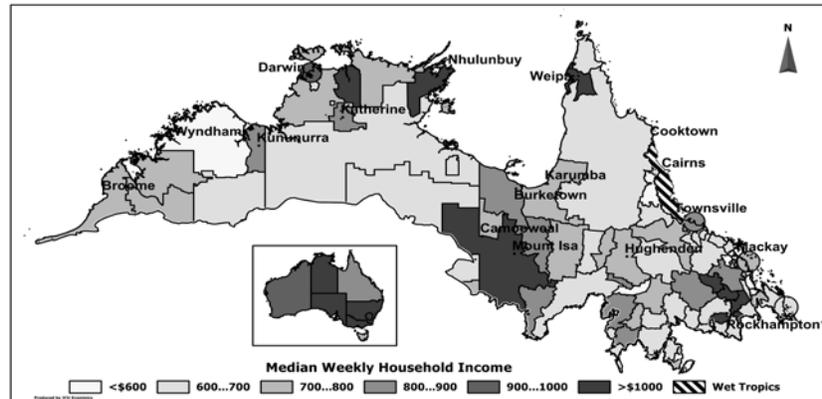
Source: Data obtained from ABS CDATA 2001

Figure 9. Median weekly household income – by postcode

Given this diversity, one expects there to be differences between the economic structure of communities in the TS and that of Australia as a whole. Those interested in making predictions about the path of economic development in the north, may not, therefore, be able to simply 'adopt' predictions derived from more populous parts of Australia. And since the economic structure of many communities within regional Australia is undergoing significant change one cannot assume that the future pattern of economic growth and development will simply follow patterns from the past.

Yet, "if regional development is to be associated with the improvement of economic and social prospects for people within a region, as opposed to simply optimising the size of gross regional product, then it is incumbent upon analysts and practitioners to construct regional development strategies around an elevated understanding of local scale economic and social interactions" (Pritchard, 2005:91). And there is a clear need for "creative and innovative solutions to the complex economic development issues faced by remote Indigenous communities" (Altman, 2004).

Sadly, there is relatively little information detailing either economic or social interactions at a fine geographic scale across the entire TS – the region is "Land rich, and data poor" (Stoeckl and Stanley, 2005). In an attempt to alleviate at least part of this information deficit, the Tropical Savannas CRC commissioned the Outback Livelihoods (OL) paper which, broadly, sought to examine the 'influence of resource flows on the viability of communities'. The research described in this paper relates to a case-study that comprised one, self-contained,

investigation within that larger OL project. Amongst other things, the economic case-study sought to investigate key industries within the TS, looking for differences and similarities between industries of the TS and those of Australia as a whole.

A key problem faced by researchers working on this project, is that there are many different ways of describing and attempting to identify the most 'important' industries within a region. One can, for example, look at the contribution that each industry makes to gross regional product (similar in concept to examining output multipliers). Likewise, one can look at the income earned by workers in different industries (similar in concept to looking at income multipliers), or at the proportion of the total workforce employed in each industry (similar in concept to looking at employment multipliers). And one can monitor the spending patterns of residents, or measure the time and effort devoted to different activities. Each tells a subtly different story.

Figure 10, for example shows the total (Australia-wide) income from each of the Australia and New Zealand Standard Industry Classification (ANZSIC) industries. Here, it seems as if the 'most important' industries to Australia are Manufacturing, Wholesale and Retail Trade. But if one measures 'importance' according to the total wages and salaries paid to workers within a specific sector, then Australia's 'most important' industries would be listed as: Property and Business services; and Manufacturing (Figure 11). Evidently, one needs to consider 'importance' from a range of different perspectives if interested in gaining an unbiased understanding of the economic contribution which different industries make within a region.
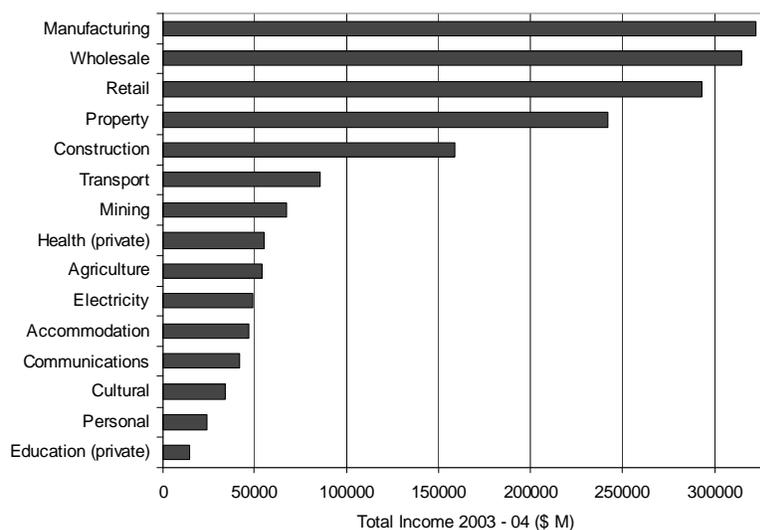
Source: Data obtained from ABS, 2007a.

Figure 10. Total Income by Industry, 2003-04 ($m)

Figure 11. Wages and Salaries by Industry, 2003-04 ($m)

To the best of our knowledge, however, there are no publicly available data about the contribution that different industries make to gross regional product at a fine geographic scale across the entire TS - although the National Centre for Social and Economic Modelling has been exploring methods of creating 'synthetic' databases which may, eventually, be capable of providing this type of information (See Lloyd and Harding, 2004; Taylor et al 2004; and Melhuish et al, 2002). Neither are there publicly available data on the income derived from different industries in remote communities across all of Australia's TS, or on the spending patterns, or preferred activities of the region's residents. The ABS's Household Expenditure Survey, for example, takes its sample from regions where there are more than 0.6 dwellings per square kilometre (ABS, 2005) – thereby excluding most of the geographic area of the TS (See Figure 3).

In short, it is not possible to use secondary data to make comparisons like those above when attempting to determine the relative importance of different industries to communities of the TS; other types of data must be used. In this case-study, researchers therefore used some secondary, ABS employment data, together with data collected from a survey of more than 900 organisations from each of the 17 different ANZIC industries across 127 different postcodes in the TS. This paper presents and analyses some of that data.

Section two focuses on the survey. It describes the way in which the survey instrument was developed and tested in a tourism case-study (Section 2.2),

before expanding the investigation to include a larger range of industries across the entire TS region (Section 2.3). It also presents some descriptive statistics on the structural characteristics of respondent organisations (Section 2.4).

Section three contains the formal analysis whereby we attempt to determine the relative 'importance' of different industries to communities within the TS in three ways – using ABS employment data, using survey data on respondent perceptions of the 'availability' of different industries, and using survey data regarding gross annual turnover. Section four summaries key findings and offers some concluding comments.

2. THE SURVEY

2.1 Preliminary Tourism Study

Much of the preliminary/developmental work relating to this project was done during 2005/06 as part of tourism research project funded by James Cook University (JCU). Because the Tropical Savanna CRC project used the survey instrument that was developed by the preliminary research project and also some of the data that was collected during the study, the tourism project is relevant here.

The first step of the tourism investigation involved developing (and piloting) a questionnaire. The questionnaire was comprised of two main parts: the first seeking background information about the respondent's organisation; the next seeking information about the types of goods and services that were available locally and about the expenditure patterns of respondent organisations.

Researchers used The Yellow Pages (2005) SENSIS website to collect contact details for all tourism enterprises listed under the headings of 'accommodation', 'tours', 'attractions and activities' (hereafter termed 'other') for all of Northern Territory, for the Douglas Shire, Townsville and 'Outback Queensland'. Across all four regions, this list comprised 699 enterprises, all of which were targeted for surveying between the 21st of May and the 28th of October 2005. Of the 699 contacted, 429 completed the survey and 270 declined to participate (producing a response rate of 61 percent). For more detailed information see: Stoeckl and Lanphier (2005), and Stoeckl (2007).

2.2 Mail and Email surveys

Only some of the data collected during the preliminary tourism study were relevant to the Outback Livelihoods (OL) case study. This was because some of the regions included in the earlier study lay outside the TS region (e.g. the southern parts of Outback Queensland). After omitting organisations located outside the Savannas, data from 266 businesses across two different industries (Accommodation and Transport) were identified as being relevant. This did not, by itself, provide information about a broad enough range of industries or across a large enough geographic scale to suit the purposes of the TSCRC case study. It was therefore important to expand the scale of the investigation, collecting information from more organisations in the Tropical Savannas (TS).

To that end, a database detailing the names and addresses of business,

government and non-government organisations throughout Australia was purchased from Media M Group (2006). In the first instance 38,406 separate organisations were identified as having a postcode with boundaries that sat either wholly or partially within the TS. These were classified into 18 industry sectors: the 17 defined in the Australia and New Zealand Standard Industry Classification (ANZSIC) codes plus one more – for organisations that were easily identifiable as focusing on Indigenous issues. Some organisations were then removed from the list since they had been listed more than once, had addresses which were clearly incorrect, and/or were not physically located in the target regions. Businesses in either the Accommodation or Transport sectors that were located in postcodes included in the preliminary tourism study were then removed, so as to avoid contacting them a second time. This left 27,892 eligible organisations from which to draw the sample.

Since it was not feasible to collect data from all 27,892 organisations, researchers had to decide on a sampling method. In doing so, researchers were cognizant of the fact that there is a significant data/research 'gap' relating to organisations operating in remote parts of Australia. It was therefore decided to place emphasis on organisations in the remoter parts of the TS (specifically those located in 'very remote', 'remote' and 'outer regional' areas).

To facilitate that, the 'population' of 27,892 organisations were classified according to (a) the industry sector and (b) the level of remoteness of their postcode – as per the ABS's classification system:

- 'Inner Regional' (ARIA+ score of 0.2 to ≤2.4)
- 'Outer Regional' (ARIA+ score of > 2.4 to ≤ 5.92)
- 'Remote' (ARIA+ score of > 5.92 to ≤ 10.53), or
- 'Very remote' (ARIA+ score > 10.53).

Recognising that response rates as low as 10 percent are not uncommon in other research projects, researchers decided to try to contact 200 organisations in each industry/remoteness category. In some cases this meant that every organisation in a particular industry/remoteness category was targeted. This was the case where there were fewer than 200 organisations in a given industry in a given level of remoteness (as in the Communications industry, where there were only 31 organisations listed in the very remote parts of the TS). In cases where the database identified more than 200 organisations in a particular industry and region, organisations were selected at random for inclusion in the sample (eg. the database listed 4371 retail organisations in the 'inner regional' parts of the TS, so every 20th organisation was targeted).

In the first instance, researchers conducted web searches to find the email address of organisations that had been identified for inclusion in the sample. If it was possible to find an email address the organisation was sent an electronic copy of the survey (with a covering email). Following the guidelines of Dilman (2000) organisations were sent four reminders. If the organisation had not returned a completed survey after the fourth reminder they were removed from the email list.

Between August 3 and September 18 2006, a total of 1960 surveys were sent out by email in four different 'batches'. In total, 304 of the email addresses

proved to be incorrect, so that only 1656 emails actually reached their intended recipients. At that time administrators at JCU asked that all email activity cease, pending legal advice as to whether the surveys could potentially be viewed as SPAM.[1] From that point onwards, all potential respondents were contacted by mail.

To avoid sending postal surveys to organisations that had already been contacted by email, new "target" lists were drawn up. Wherever possible, organisations were only selected if they had not already been contacted. Since it is more expensive to conduct a postal survey than an email survey, it was necessary to lower the original target of 200 per industry/remoteness category to just 50. This meant that in some cases every organisation in a particular industry and remoteness category was targeted, as previously discussed. In other instances, organisations were selected randomly to be included in the sample of 50 organisations per industry and remoteness category. This surveying method was followed as per Dilman (2000). In the first instance, those targeted for inclusion in the postal survey (2489 organisations) were sent an introductory letter (September 28 and 29, 2006). They were then sent a copy of the questionnaire (October 10 to 12, 2006), a reminder letter (November 03, 2006), and a replacement questionnaire (November 28, 2006). A copy of the questionnaire is available on request.

As is usually the case with postal surveys, many were returned with incorrect addresses. The problem here, however, was that the incorrect addresses fell disproportionately in some industries. For example, a much higher proportion of surveys sent to those in the Agricultural sector were returned with bad addresses than organisations in the Property and Business Services sector. Hence there were few responses from this group. A second batch of 1712 surveys was therefore sent out between December 1 and 3, 2006 primarily targeting industry/remoteness categories that had received few responses from the either the email or the first postal survey. In total, researchers mailed out 4201 questionnaires, in two different batches, although 1047 were returned with incorrect addresses. Therefore only 3154 questionnaires reached their intended recipients.

2.3 Responses and response rates

Table 1 provides a detailed breakdown of the total number of valid (operational) businesses identified in the database (including all tourism businesses), the total number of organisations that researchers were able to contact via email or mail (i.e. removing bad addresses) and the total number of completed email or postal surveys received for each category of industry and remoteness.

Overall, responses were obtained from 14.5 percent of those contacted by post or email. By industry, the highest response rates (as a percentage of those contacted) were obtained from organisations in the Health sector (36.7 percent),

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[1] JCU researchers were subsequently informed that emails were not SPAM – but by then it was too late to resume.

from Indigenous associations (25.4 percent), and from the Construction (20.27 percent) and Finance (19.66 percent) sectors. The lowest response rates were obtained in the Communications, Wholesale and Manufacturing sectors (with only 4.96, 5.75 and 7.08 percent respectively).

Table 1. Responses and Response Rate for Email and Postal Survey – by Industry and remoteness

INDUSTRY		Remoteness				
		Inner Regional	Outer Regional	Remote	Very Remote	Total
Accommodation, Cafes and Restaurants	Responses	4	10	17	22	53
	% of those sent survey	57.14	11.11	18.48	17.46	16.83
	% of those in database	6.56	0.80	4.89	4.24	2.44
Agriculture, Forestry and Fishing	Responses		10	20	24	54
	% of those sent survey		14.49	14.60	10.86	12.65
	% of those in database		1.07	1.94	1.71	1.59
Communication Services	Responses		1	2	3	6
	% of those sent survey		1.27	20.00	9.38	4.96
	% of those in database		1.08	11.76	9.68	4.17
Construction and Trade Services	Responses	2	27	24	36	89
	% of those sent survey	25.00	18.12	24.00	19.78	20.27
	% of those in database	1.21	1.09	5.00	7.78	2.49
Cultural and Recreational Services	Responses		10	6	10	26
	% of those sent survey		18.18	7.23	6.54	8.87
	% of those in database		1.38	2.91	4.46	2.16
Educational Services	Responses		17	9	16	42
	% of those sent survey		9.88	8.82	11.94	10.19
	% of those in database		3.78	5.92	7.80	5.02
Electricity, Gas and Water Supply	Responses		1	2	2	5
	% of those sent survey		3.23	28.57	13.33	9.43
	% of those in database		2.22	22.22	10.53	6.76
Finance and Insurance	Responses		21	7	7	35
	% of those sent survey		18.92	20.00	21.88	19.66
	% of those in database		6.07	12.07	18.92	7.81
Government Administration and Defence	Responses	2	12	5	12	31
	% of those sent survey	200.00	17.14	11.36	11.76	14.29
	% of those in database	28.57	5.11	5.56	6.28	5.93

INDUSTRY		Remoteness				
		Inner Regional	Outer Regional	Remote	Very Remote	Total
Health and Community Services	Responses	1	24	20	29	74
	% of those sent survey		38.10	35.09	37.18	37.37
	% of those in database	1.67	2.13	8.77	10.70	4.39
Indigenous	Responses		10	13	25	48
	% of those sent survey		30.30	65.00	18.38	25.40
	% of those in database		16.39	38.24	9.84	13.68
Manufacturing	Responses		5	6	4	15
	% of those sent survey		7.81	8.96	4.94	7.08
	% of those in database		0.83	5.04	2.80	1.65
Mining, Quarries and Related Services	Responses	1	3	8	6	18
	% of those sent survey		4.92	19.51	18.75	14.88
	% of those in database	20.00	2.73	9.52	12.00	7.23
Personal and Other Services	Responses	1	12	7	14	34
	% of those sent survey		22.22	8.43	12.73	13.77
	% of those in database	2.13	1.58	4.02	6.60	2.85
Property and Business Services	Responses	1	25	7	12	45
	% of those sent survey	25.00	9.92	5.47	8.76	8.64
	% of those in database	0.74	0.96	1.69	2.88	1.26
Retail Trade	Responses	1	16	30	20	67
	% of those sent survey	16.67	14.41	24.39	11.05	15.91
	% of those in database	0.28	0.37	3.26	1.77	0.99
Transport, Travel and Storage	Responses		9	13	19	41
	% of those sent survey		21.43	19.40	11.66	15.07
	% of those in database		1.14	6.40	4.85	2.89
Wholesale Trade	Responses		8	1	1	10
	% of those sent survey		6.11	7.14	3.85	5.75
	% of those in database		4.23	5.56	3.13	4.00
Total	Responses	13	212	186	238	697
	% of those sent survey	37.14	12.95	15.37	12.26	14.49
	% of those in database	1.27	1.24	4.06	3.97	2.42

As regards the representativeness of the sample: responses were received from more than 2 percent of listed organisations. However, close to one quarter of all organisations listed in the database were non-operational. Therefore the

sample may represent closer to 3 percent of the population of operational businesses. In some sectors, the representativeness of the sample is relatively good (for example, it accounts for 7.8, 7.2, 6.8 and 6.1 percent of organisations listed in the database in the Government, Electricity, Mining and Finance industries). However, our sample includes responses from fewer than 2 percent of the 'population' of organisations in the Retail, Property, Agricultural and Manufacturing sectors. Consequently data pertaining to these industries should be treated with caution – if only because the sample may not adequately reflect the population as a whole.

In total, 978 organisations completed and returned questionnaires (266 from the tourism case study, 202 from the email surveying and 510 from the postal surveying). As shown in Figure 12, respondents were scattered across the entire TS region. Although responses were not received from every postcode, completed questionnaires were returned from organisations in each of ANZIC's 17 different industries across regions of varying degrees of remoteness. Thus, although the sample is itself imperfect (particularly given the low number of responses in Communication Services, Electricity Gas and Water), it can, nevertheless be considered to be reasonably representative of many parts of the TS, and makes a significant addition to the existing set of knowledge about industries in Northern Australia.
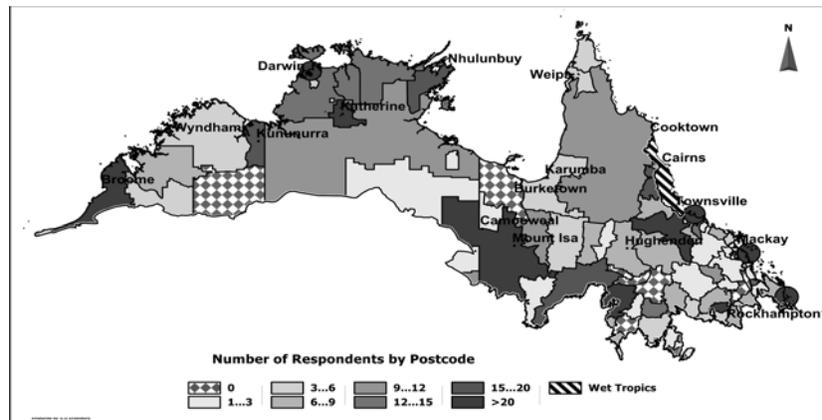
Figure 12. Number of respondents by postcode

2.4 Characteristics of Respondents

2.4.1   Size of Organisation

As shown in Figure 13 most respondent organisations were relatively small – the median number of employees within most industry/remoteness categories was less than 10, with many sectors having a median number of employees of less than 5. Only 1.03 percent of respondent organisations (11 out of the 963 who responded to the employment question) had more than 200 employees – as

compared to 1.2 percent of non-government organisations in Australia (ABS, 2007). Not surprisingly, the largest organisations were in the Mining and Government sectors, employing, on average 120 and 56 people respectively. The smallest organisations were those in Communications – although responses were received from only 6 organisations in that sector, and should, therefore, be treated with caution.
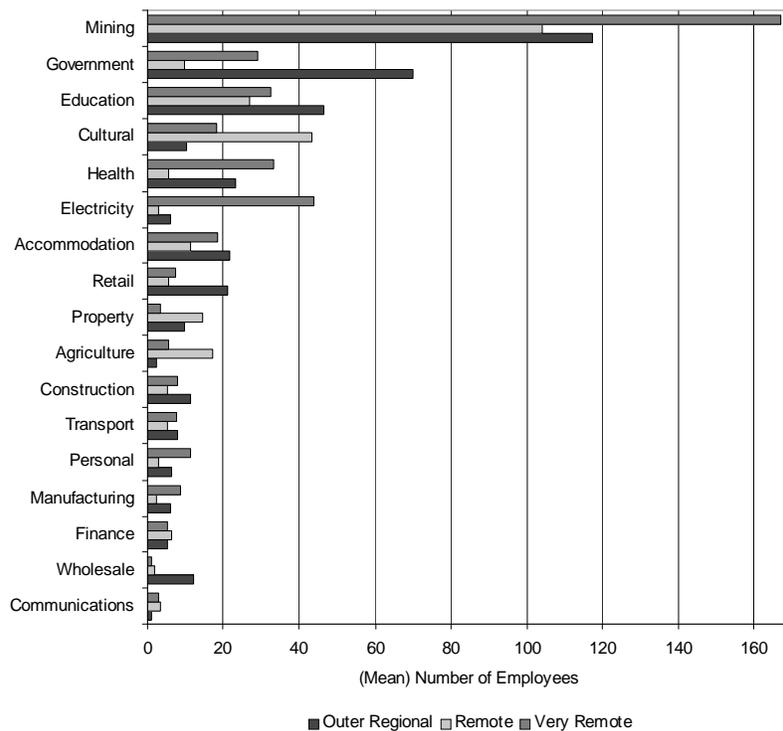
Figure 13. Mean number of employees – by industry and remoteness

There does not appear to be a simple relationship between the size of an organisation and its remoteness. The average number of employees in organisations that are part of the Personal sector, for example, is larger in very remote areas than in outer regional areas, whereas the average size of organisations in the Government sector appears to be smaller in the remoter parts than in the inner regional areas. Post-hoc tests of the differences in the average number of employees across regions of remoteness found the differences to be statistically insignificant.

2.4.2   Average Gross annual turnover

The email and postal surveys asked respondent organisations to give an indication of the annual gross turnover (or budget) of their operation, as per the following question:

What is your annual gross turnover (or budget)?   For organisations with multiple sites (e.g. branch offices, franchises etc) please only consider your specific location.

  ☐ *LESS THAN $10,000 PER YEAR*
  ☐ *$10,000 TO $500,000 PER YEAR*
  ☐ *$500,001 TO $1 MILLION DOLLARS PER YEAR*
  ☐ *BETWEEN $1 AND $5 MILLION DOLLARS PER YEAR*
  ☐ *MORE THAN $5 MILLION DOLLARS PER YEAR*

Responses were coded using the mid-point of each range (i.e. $5,000; $255,000; $750,000; and $3 million), except for the highest category, which was coded as $5m (giving an unambiguous downward bias in this category).

As shown in Table 2 the mean annual gross turnover across all respondent organisations was approximately $1.2m.   However, there is considerable variation in mean annual gross turnover across regions and across industry type. Not surprisingly, the largest average annual turnovers (or operating budgets) occur in the Mining, Wholesale, Government and Electricity Gas and Water Supply sectors ($2.8m, $2.6m, $2.5m and $2.3m respectively).   The smallest turnovers occur in the Personal ($219,000), Communications ($316,000), and Cultural ($548,000) sectors.   There does not appear to be any simple relationship between remoteness and gross annual turnover.

2.4.3   Years of Operation

Respondents were asked to indicate whether their organization had been operating for (a) less than one year; (b) 1 – 5 years; (c) 6 – 10 years; or (d) more than 10 years.   Answers were coded as (a) 0.5 years; (b) 3 years; (c) 8 years; and (d) 10 years (giving an unambiguous downward bias in this category), and the mean years of operation of organisations within each industry/region were calculated.

Across all respondents, the average length of time in operation was close to 8.5 years (Table 3). This is somewhat higher than might be expected given that more than 33.5 percent of all Australian small businesses have been in operation for less than 5 years (ABS 2004). This may be due to response bias – whereby newly established organisations were less likely to complete the survey then those who had been operating for several years – but it may also be the case that those businesses that do survive, do so for a long time, and so there is a lower rate of business turnover in the TS than across the nation as a whole.

Table 2. Average gross annual turnover – by remoteness and industry ($000)

| ANZSIC INDUSTRY | Remoteness | | | | Average across all regions |
	Inner Regional	Outer Regional	Remote	Very Remote	
Accommodation		859	1,036	1,305	1,114
Agriculture		579	1,536	629	920
Communications					316
Construction		1,285	920	753	957
Cultural		786	130	527	548
Education		520	1,479	894	900
Electricity					2,302
Finance		1,239	2,652	1,065	1,466
Government		3,323	1,402	2,022	2,465
Health		1,328	288	1,263	1,044
Manufacturing			403		1,190
Health			2,752		2,852
Personal		199	224	230	219
Property		1,082	1,065	530	909
Retail		1,714	1,037	1,318	1,261
Transport		2,501	829	1,270	1,366
Wholesale		2,958			2,572
Average across all industries	1,711	1,289	1,047	1,123	1,167

Notes: To preserve confidentiality, results are not reported for categories with 5 or less respondents.

Table 3. Average years in operation – by Remoteness and Industry

| ANZSIC INDUSTRY | Remoteness | | | | Average across all regions |
	Inner Regional	Outer Regional	Remote	Very Remote	
Accommodation	5.33	6.50	7.82	5.57	6.54
Agriculture		8.85	8.30	9.63	8.99
Communications		3.00	6.50	6.50	5.80
Construction	10.00	8.96	8.40	9.05	8.86
Cultural		9.10	10.00	9.15	9.31
Education		9.56	9.18	9.76	9.55
Electricity		10.00	10.00	8.00	9.20
Finance		8.50	8.64	9.00	8.63
Government	10.00	9.46	8.42	9.53	9.36
Health	10.00	8.50	8.79	9.05	8.84
Manufacturing		7.80	8.17	10.00	8.53
Health	8.00	10.00	8.38	10.00	9.17
Personal	10.00	9.36	9.13	9.50	9.38
Property	10.00	7.92	5.64	5.79	7.04
Retail	0.50	7.91	7.68	7.44	7.57
Transport		8.44	8.15	8.11	8.20
Wholesale		9.13	8.00	10.00	9.10
Average across all industries	7.68	8.61	8.27	8.61	8.50

Notes: To preserve confidentiality, results are not reported for categories with 5 or less respondents.

There are also some interesting sectoral differences. For example, organisations in the Communications, Accommodation, Property, and Retail sectors, were generally much 'younger' than other organisations. In fact, the average organisation in the educational sector had been in operation for almost twice as long as the average organisation in Communications (9.5 years versus 5.8).

2.4.4 ATSI Involvement in the Organisation

Despite the fact that most regions within the TS have populations that are comprised of more than 25% ATSI peoples, relatively few respondents indicated that their organisation was owned or managed by an Indigenous person or organisation (just 6.11% over all). This is significantly less than expected on the basis of population ethnicity. A further breakdown of ATSI ownership or management by remoteness categorisation is given in Table 4.

Table 4. Proportion of respondent organisations owned or managed by ATSI peoples – by Remoteness and Industry

ANZSIC INDUSTRY	Remoteness				Average across all regions
	Inner Regional	Outer Regional	Remote	Very Remote	
Accommodation		1.82	7.84	5.19	4.13
Agriculture		0	0	0	0
Communications					0
Construction		3.57	0	2.70	2.20
Cultural		15.38	0	28.57	18.18
Education		5.56	18.18	5.88	8.70
Electricity					0
Finance		4.55	0	0	2.78
Government		7.69	16.67	36.84	22.50
Health		4.00	16.67	21.62	14.94
Manufacturing			0		0
Health		0	0	14.29	5.26
Personal		0	12.50	0	2.86
Property		7.14	0	0	4.17
Retail		5.88	9.09	0	5.63
Transport		1.49	0	7.69	2.48
Wholesale					0
Average across all industries	0	3.40	6.10	9.54	6.11

Notes: To preserve confidentiality, results are not reported for categories with 5 or less respondents.

It must be acknowledged that the low ATSI representation observed in this study may be the result of survey response bias (for example, organisations with ATSI owners and/or managers may have been much less likely to respond to the survey than their non-ATSI counterparts). Yet the low ATSI representation in organisations that is apparent in these results is consistent with findings of the Commonwealth of Australia (2003, p 25), which notes that "Indigenous participation in business is below the reasonable expectations of government and Indigenous parties themselves". Accordingly, it may be reasonable to assume

that the sample data are a reasonably accurate representation of the true population, the conclusion being that ATSI persons are under-represented in the management and ownership of organisations across the TS region.

This is particularly evident in the Agriculture, Communications, Electricity, Manufacturing, and Wholesale sectors, amongst which not a single respondent organisation indicated that they were owned or operated by persons of ATSI descent.   With the exception of Agriculture, these industries also have a relatively low proportion of workers who are of ATSI descent (Table 5). Agriculture is a particularly interesting exception; the average respondent organisation had a workforce that was almost 20 percent ATSI, but there was no ATSI involvement at the ownership/management level.

Table 5. Proportion of employees who are of ATSI descent – by industry and remoteness

ANZSIC INDUSTRY	Remoteness				Average across all regions
	Inner Regional	Outer Regional	Remote	Very Remote	
Accommodation		11.11	17.38	5.82	10.00
Agriculture		0.00	5.19	56.00	20.83
Communications					0.00
Construction		1.55	0.00	13.35	6.07
Cultural		5.27	8.33	37.45	24.10
Education		4.49	20.10	21.62	13.63
Electricity					2.35
Finance		0.85	13.25	0.00	2.09
Government		12.29	14.38	47.22	29.41
Health		11.72	23.08	42.17	28.40
Manufacturing		0.00	0.00	7.42	2.97
Health		5.00	0.00	17.59	11.62
Personal		0.00	0.00	4.29	1.71
Property		0.00	11.73	10.42	3.83
Retail		10.28	13.79	6.63	10.11
Transport		10.00	11.67	13.63	12.36
Wholesale					1.67
Average across all industries	2.00	5.06	12.31	24.14	14.11

Notes: To preserve confidentiality, results are not reported for categories with 5 or less respondents.

That point aside, a relatively high proportion of respondent organisations within Government (22.5 percent), Cultural (18.18 percent) and Health (14.92 percent), were owned or managed by ATSI persons. As might be expected, these figures are higher in the very remote areas than in the outer regional parts of the TS (Figure 14). It is also the Government, Health and Cultural sectors that have the highest proportion of employees who are ATSI (with 29.4, 28.4 and 24.1 percent respectively).
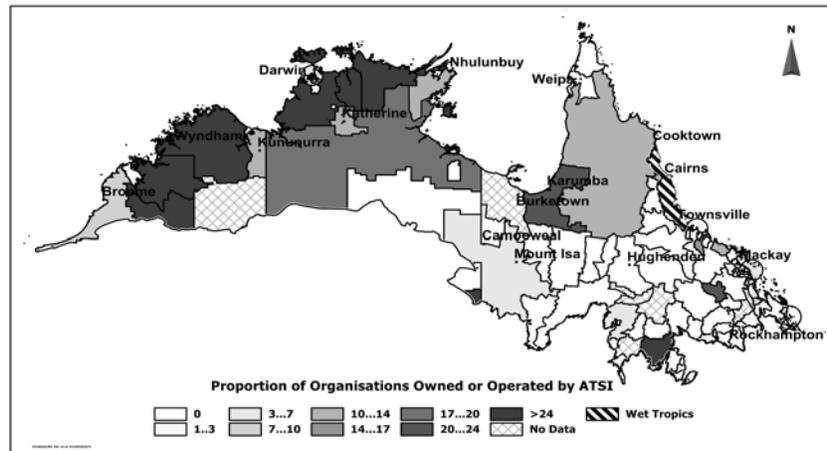
Figure 14. Proportion of organisations owned or operated by ATSI – by postcode

3. KEY INDUSTRIES OF THE TROPICAL SAVANNA REGION

As mentioned earlier, there are many ways to assess the importance of an industry/sector to a regional community. One simple method is to count the number of registered businesses or organisations of different types within each region – as was done when categorizing the names of organisations from the mailing list referred to Section 2. If one does this, the Retail sector stands out as the 'most important' sector across the entire TS region, closely followed by Construction; Property and then Agriculture – although that ranking differs across regions: in the remote and very remote areas, for example, Agriculture is the most commonly listed type of organisation, followed by Retail, Construction, and finally Property.

The key problem here, however, is that a simple count of the number of organisations of each type in a region provides no information about other characteristics which may be of interest, such as employment provided by them. Neither does it provide information about the goods and services provided by different organisations or about size. This section thus attempts to determine the relative importance of industries to communities within the TS in three ways – using ABS employment data, using respondent perceptions of the availability of different industries, and using survey data regarding the gross annual turnover. In each case, an industry is identified as being important to a region if it is one of the 'top 3' industries using that measure (e.g. one of the top three employers; one of the three most 'available' industries; and/or a sector with one of the three largest gross annual turnovers).

3.1 Industry of Employment

As can be clearly seen in Figure 15, the Retail sector employs the highest proportion of workers across Australia as a whole – yet this industry provides less than one-half of the employment that the Government sector does in very remote parts of the TS.[2] While this industry is also a key employer in inner regional parts of the TS, it seems to be a relatively less important to people in remote areas. Other industries which seem to be less important to remote communities within the TS than to Australia as a whole are: Manufacturing, Wholesale, Property, Finance, and, to a lesser extent, Health.

To be more specific, if the criteria which one uses to measure the 'importance' of an industry, is the regional employment that it generates, then the 'top 3' industries for Australia as a whole are (in order): Retail, Manufacturing and Property. In the outer regional parts of the TS, the 'top 3' industries are (again in order): Retail, Government and Health. In contrast, the 'top 3' industries in remote parts of the TS are Mining, Agriculture and Retail, whereas Government, Agriculture and Retail are the 'top 3' industries in very remote parts.

Evidently, the structure of the workforce in the TS does not always mimic that of the Australian workforce as a whole, particularly in remote areas. So the use of Australian or state/territory-wide figures to describe the economic and social activity of some of regional centres or towns may be justified, but it is clear that the use of such figures in the more remote areas of the TS region may not lead to accurate results.

Regional differences in the relative importance of different industries are even more evident if examined at a finer geographic scale. Figure 16[3] clearly highlights the fact that the Government sector is the single largest employer across almost two-thirds of the geographic area of the TS. On the surface, this may seem to conflict with other data sources, for example in the Northern Territory the mining industry accounted for 19 percent of Gross State product during 2004-05 (Northern Territory Government 2005). Yet as noted by Pritchard (2005: 79), "the resources sector is frequently the largest contributor to northern remote Australian regions in terms of gross regional product…but other sectors (such as Government or services) often tend to be more important in terms of local income flows".

To the extent that income flows are linked to employment, it is evident that Government is indeed of vital importance to the TS. Furthermore, this finding accords with those of the Commonwealth of Australia 2005 (p11.18) which

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[2] When producing this graph, postcode level data from the ABS 2001 Census were used to calculate the percentage of the workforce employed in each industry (using the Australian and New Zealand Standard Industrial Classification) and this information was further sub-divided according to the level of 'remoteness' of each postcode.

[3] When constructing this figure, ABS employment data were used to calculate the percent of all workers employed in each sector within each of the 122 postcodes whose boundaries sit either wholly or partially within the TS. For each post-code, the industry employing the greatest number of people was identified and it is this which is mapped.

clearly identify the public sector as being the most significant employer of Indigenous people in very remote parts of Australia. Evidently, it is not just Indigenous people who rely on the Government for Employment in these regions.
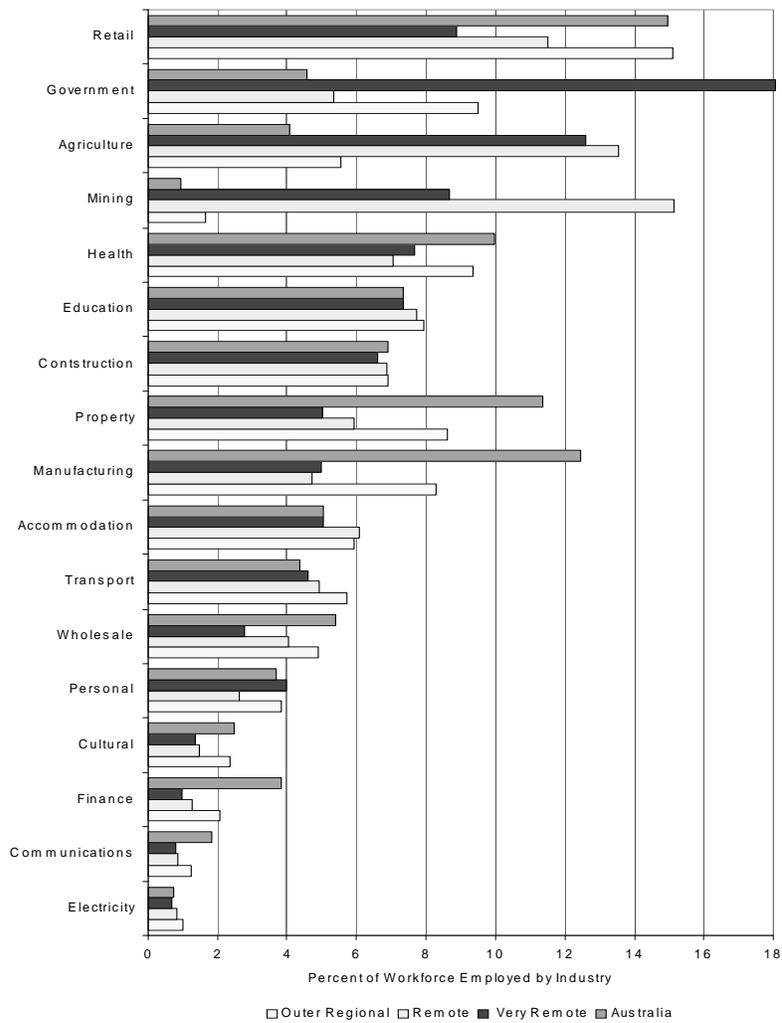
Source: Data obtained from ABS CDATA 2001

Figure 15. Percent of workforce employed in different industries in Australia and the TS – by remoteness

Figure 16 also shows that the Retail sector is the most important industry of employment in regional centres; the mining sector is the largest employer in several enclaves (inland from Mackay/Rockhampton, around Mount Isa and Weipa); and the Agricultural sector provides most employment to the majority of other (non-Government) regions.   Evidently, regions that are geographically 'close' can also be economically 'distant', and an industry which is a vital provider of employment in one district, may be all but irrelevant in another. The Agricultural industry, for example, accounts for 100 percent of employment in some postcodes and no employment at all in others. There is also considerable variation in the dependence of regions on the Government and on the Mining sector for employment. In some postcodes these sectors account for 96 and 56 percent of employment, respectively, and in others they provide no employment at all.
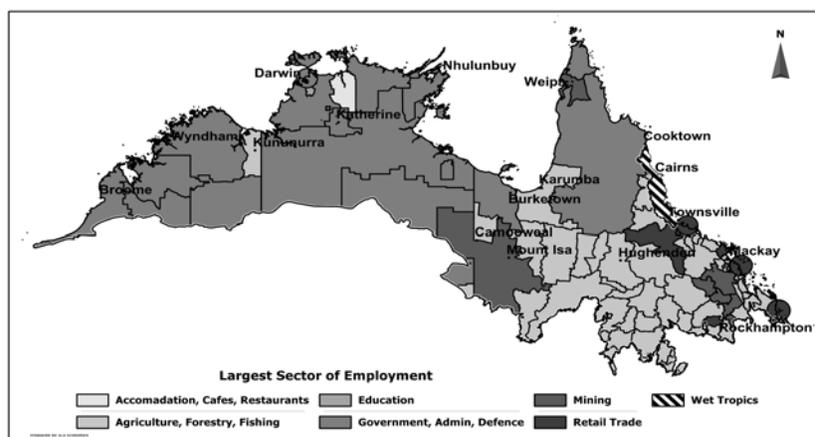
Figure 16. Largest sector of employment in the TS region – by postcode

The most important point to be made here, therefore, is that different communities in different parts of the TS depend upon different industries for employment – even when classified similarly with respect to their level of 'remoteness'. It may not, therefore, be appropriate to simply aggregate regions within the TS according to their 'remoteness' and then analyse the behaviour of associated averages.

3.2 Respondent perception industry 'availability'

Respondents who participated in both the email and the postal survey were asked to comment on the 'availability' of each of ANZICs 17 industries within their local area. The term "local" was explicitly defined as being within the

same postcode, or same town – for cases where the town comprised multiple postcodes.

More specifically, the question was posed as follows:

Please advise whether the following types of businesses and organisations are available within your local region by ticking the appropriate box. Please answer regardless of whether you spend money at these businesses or not.

TYPE OF BUSINESS/ORGANISATION	NONE AVAILABLE LOCALLY	SMALL NUMBER AVAILABLE LOCALLY	SOME AVAILABLE LOCALLY	FULL RANGE AVAILABLE LOCALLY
Retailers *e.g. supermarkets, stores, petrol stations*	☐	☐	☐	☐

Answers were coded on a scale of 1 to 4 (1 for none available locally; 4 for full range available locally) and each response was associated with the ARIA+ index corresponding to the postcode of the respondent's organisation. It must be kept in mind that these responses came only from a sample of people involved in businesses, government or other not-for-profit organisations in the TS and may not reflect the opinions of the broader community. But they do provide a useful insight into regional variations in the availability of different types of Industries.

Not surprisingly, mean responses to questions about the availability of different types of goods and services are almost always lower in the remote regions than in the Outer Regional areas and these differences are statistically significant (ascertained via an ANOVA). Across the TS as a whole, the Manufacturing, Wholesale, Government and Mining sectors scored lowest on the 'availability' scale, whilst the Retail, Construction and Accommodation industries were identified as being the most 'available' (Figure 17).[4]

Thus, if the criteria which one uses to measure the 'importance' of an industry, is its perceived 'availability' within the region, then the 'top 3' industries in outer regional parts of the TS are (in order): Property, Construction and Retail. The same industries fill the 'top 3' industries in remote parts of the TS, albeit in a slightly different order, (Construction, Retail and Property), whereas Retail, Construction and Accommodation are the 'top 3' industries in very remote parts. Evidently, the Retail and Construction industries are readily 'available' across all parts of the TS; with both the Property and Accommodation sectors featuring prominently in most parts.

Interestingly, it is not always the sectors that provide the most regional employment (Government, Agriculture and Mining, as discussed in the preceding section) that are perceived by respondents as being the most 'available'. A large part of this could reflect the fact that organisations within both the Government and the Mining sectors are generally larger than those within the Retail sector. So whilst respondents report that there are relatively

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[4] Data from the "inner regional" areas have been omitted from this figure since there were only 5 responses.

few of these organisations scattered throughout the TS (particularly if compared to the number of retail outlets), they are still important to the region for the employment and commodities they provide. Similarly, some sectors (Retail in particular) are likely to include many owner-operated businesses. Small retail outlets may, therefore, be prevalent across large tracts of the Savanna, providing goods, income and self-employment, but little 'formal' employment. The data presented in Figure 15 are thus likely to understate the importance of some sectors as providers of income in the TS because of high levels of self-employment.
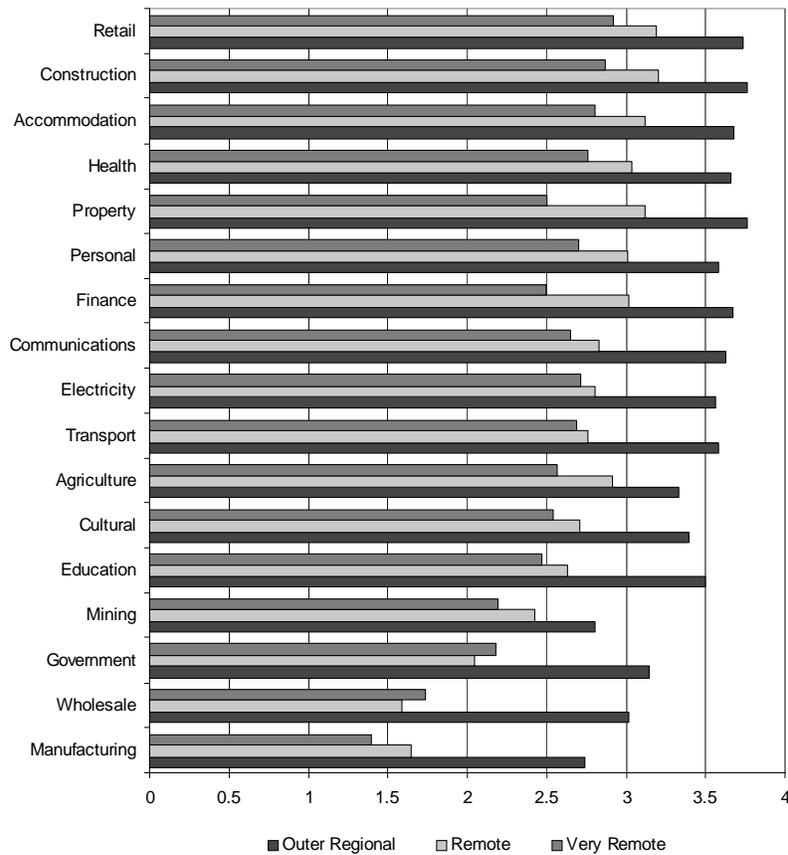
Figure 17. Respondent perception of the availability of different industries within the TS – by remoteness

3.3 Gross annual turnover

We are not aware of the existence of any data that would enable a comparison between aggregate incomes generated by different industries across the TS. However, we were able to use the survey data to make some 'back-of-the-envelope' calculations that allow the drawing of inferences about the likely financial contribution of key industries to the region.

Specifically, for each industry/remoteness category, we multiplied the estimated number of operational organisations [5]by the corresponding estimate of the average gross annual turnover (as per Table 2) to generate an estimate of the total regional turnover of each industry. These estimates are presented in Figure 18 and Table 6).

Before continuing, it is important to stress that these estimates are derived from survey data relating to Annual Gross Turnover (or operating budget, in the case of government departments). They are not, therefore, directly comparable to ABS estimates of regional product or income. Furthermore, these estimates are themselves, only as accurate as the data from which they were derived – and there were clearly some problems with the accuracy of postal database, sampling etc. Nevertheless, the figures presented in Table 6 appear plausible. Our database listed 28,000 organisations that were located within the TS region (approximately 1.5 percent of all Australian businesses[6]). And the aggregate estimate of the annual turnover of all organisations in the TS is just over $25 million; approximately 1.55 percent of the ABS's (2007a) estimate of the total income of all Australian businesses during 2003-04. So whilst we urge readers to treat these figures as indicative rather than definitive, we note that they provide useful insights into the structure of regional economies.

In the first place, it is evident that the Retail sector plays a vitally important role within the TS. It may employ fewer people than the Government, Agricultural or Mining sectors, and the average annual turnover of organisations within the retail sector ranks only 7th (out of 17 sectors) however there are numerous retail outlets throughout the region. By sheer weight of numbers, Retail stands as one of the most 'important' sectors of the TS (if measuring 'importance' by the estimated aggregate annual turnover in each industry). This serves to affirm respondent perceptions of the availability of different industries, where Retail scored highest in most regions.

The Construction, Property, and Agricultural sectors appear to be similarly 'important' players in the TS, each with an estimated aggregate annual turnover in excess of $2m. The two least 'important' sectors in terms of aggregate annual turnover are Electricity and Communications.

As might be expected, there are also differences across regions with differing levels of remoteness (Table 6). Specifically, it is the Retail, Agriculture and

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[5] Approximately 25 percent of all surveys were returned to sender. We therefore estimated the number of operational organisations within each category as 0.75 times the number listed in the data base.

[6] 2,265,562 businesses were registered in Australia in 2003-04 (Australian Bureau of Statistics, 2007, Catalogue 81550).

Accommodation sectors which dominate the very remote parts of the TS. In contrast, it is the Agricultural sector which dominates the remote areas – closely followed by Retail. Construction and Property are also relatively important in these 'remote' parts, although Accommodation is less important than in the 'very' remote parts. The Retail sector is unquestionably the most significant 'player' in the outer regional areas, with Construction and Property also figuring prominently.
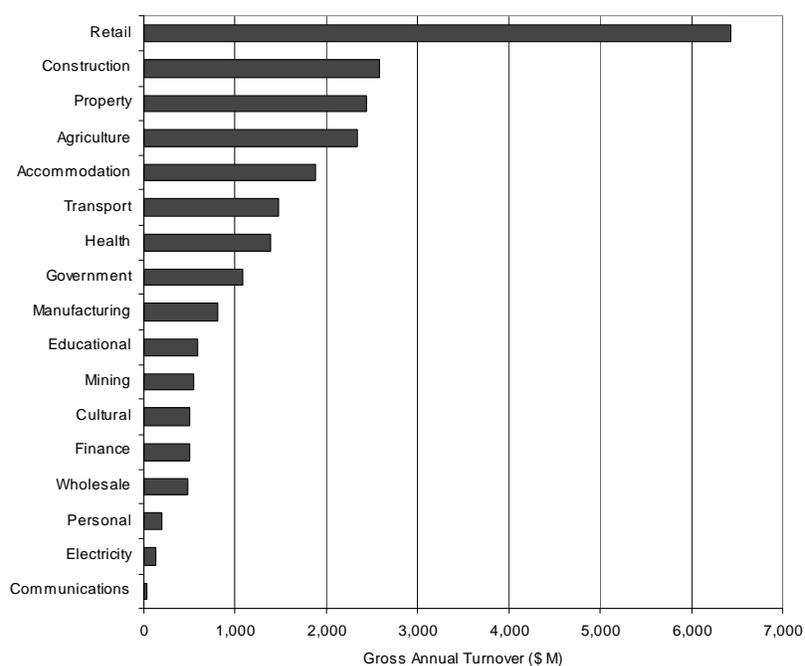
Figure 18. Estimated aggregate gross annual turnover of industries within the TS

4. CONCLUSION

In 2001, the 'top 3' sectors for employment across Australia as a whole were: Retail; Manufacturing and Property (accounting for 14.94, 12.46 and 11.35 percent of the workforce respectively). The 'most' important sectors to Australia as a whole in terms of total income earned were Manufacturing, Wholesale and Retail and the most important sectors in terms of total wages and salaries paid were Property, Manufacturing and Retail. Yet ABS employment data, and survey data on the perceived 'availability' and average gross annual turnover of different sectors at a relatively fine geographic scale, indicates that some of the

sectors which are so 'important' to Australia as a whole, are not important to communities within the TS.   The important exception to this is Retail.

Table 6. Estimated aggregate turnover – by remoteness and industry ($M)

Industry	Estimated aggregate gross annual turnover ($M)				
	Inner Regional	Outer Regional	Remote	Very Remote	Group Total
Accommodation		805	272	526	1,870
Agriculture		407	1,190	662	2,336
Communications					34
Construction		2,384	331	264	2,578
Cultural		428	20	96	507
Education		176	170	141	581
Electricity					128
Finance		322	115	30	500
Government		588	95	339	1,073
Health		1,122	50	292	1,384
Manufacturing		397	36		811
Health			173	95	546
Personal		114	29	37	197
Property		2,108	331	166	2,435
Retail		5,618	715	1,118	6,429
Transport		1,486	126	382	1,472
Wholesale		419			482
Total	1,307	16,549	3,585	5,055	25,469

Specifically, the Retail sector is one of the 'top 3' employers in regional, remote and very remote parts of the TS.   And survey data relating to the 'availability' of different industry sectors across different parts of the TS indicate that the Retail sector is the most important regional sector.   Likewise, our estimates of the gross annual turnover of industries across the TS, indicate that the Retail sector is vitally important to the region.

But other sectors, which are 'important' to Australia as a whole, are all but nonexistent in parts of the TS.

Manufacturing, for example, is in the Australian 'top 3' – if measured by the employment it generates, total income earned, or wages and salary paid – but the sector does not appear in any of the Savanna's 'top 3'. Similarly, Wholesaling is one of Australia's most 'important' sectors – either measured by the employment it provides or by the total income attributable to the industry – but it appears to be a relatively unimportant in the TS on any of the measures considered in this paper.   Other sectors which do not feature prominently in the TS – in terms of employment, (estimated) aggregate turnover, or respondent perceptions of 'availability' – include the Electricity and Communications Sectors.   This is particularly evident in the remoter parts of the Savanna. Interestingly, the lack of availability and the low estimates of aggregate turnover within the Communications sector conform with observations from a wide variety of sources regarding the general lack of communications infrastructure in remote parts of Northern Australia (Bandias and Vermui, 2005).

The key message of this paper is, therefore, that small, regional communities in the TS – particularly those in remote and very remote parts – are not just

'smaller versions' of larger, Australian communities. Their economic structure differs, sometimes significantly, from that of Australia as a whole. And the economic structure of one regional community, may differ significantly from that of another, adjoining region. Many remote communities, for example, rely almost entirely on one sector for employment – and that sector, is frequently the Government. But considerable variation is apparent. A community that relies almost entirely on the government sector for employment may be adjacent to one that relies on the agricultural sector, which in turn, may be adjacent to one that is dependent upon mining.

The "phenomena of industry clusters is nothing new and the economic reasons for the geographic concentration of firms and industries" are varied (Roberts, 2004).   But we can find no evidence of a simple, predictable relationship between the remoteness of a region and its economic structure. One cannot simply examine the inner regional and the very remote parts of the TS, interpolating results for areas that lie somewhere between the two extremes. Likewise, one cannot assume that similarly remote regions will have similar economic structures.

This has important policy implications. Data that has been collected and aggregated across relatively large regions may not adequately describe what is happening within its component parts; and models which use regionally aggregated data sets are unlikely to produce results that are meaningful to small communities. Researchers and policy makers may thus need to take careful heed of calls to think about different ways of describing and analysing rural and remote economies (such as Pritchard's 2005, reference to Northern Australia's 'dual' economy , and Altman's 2001 and 2004 call for a 'hybrid economy' approach to thinking about Indigenous issues).

REFERENCES

Altman, J.C. (2001) Sustainable development options on Aboriginal land: The hybrid economy in the 21st century. Discussion paper no.226, http://www.anu.edu.au/caepr/Publications/DP/2001_DP226.pdf [Accessed 17 July 2006].

Altman, J.C. (2004) Economic development and Indigenous Australia: contestations over property, institutions and ideology. *The Australian Journal of Agricultural and Resource Economics*, 48(3), pp.513–534.

Australian Bureau of Statistics (2001a) *2001 Census Data: Australia*, http://www.abs.gov.au/AUSSTATS/abs@cpp.nsf/DetailsPage/02001?OpenDocument&tabname=Details&prodno=0&issue=2001&num=&view=& [Accessed 26 June 2006].

Australian Bureau of Statistics (2003) *Australian Social Trends 2003*, http://www.abs.gov.au/ausstats/abs@.nsf/2f762f95845417aeca25706c00834efa/add11adceb024dfaca2570eb0082e465!OpenDocument [Accessed 26 June 2006].

Australian Bureau of Statistics (2005) *Household Expenditure Survey 2003-04*, http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/6D5F1DDFF4729C60CA25705900755727/$File/65300_2003-04.pdf [Accessed 26 June 2006].

Australian Bureau of Statistics (2006a) *Australian Economic Indicators*, http://www.abs.gov.au/AUSSTATS/abs@.nsf/featurearticlesbyCatalogue/9338D191D5717C48CA256FE600821530?OpenDocument [Accessed 23 June 2006].

Australian Bureau of Statistics (2007a) *Australian Industry 2003-04,* Catalogue Number 8155.0, http://www.abs.gov.au/Ausstats/abs@.nsf/ [accessed 24 Jan 2007].

Bandias, S and Vermui, S. (2005) Telecommunications infrastructure facilitating sustainable development of rural and remote communities in Northern Australia. *Telecommunications Policy,* 29, pp.237–249.

Chapman *A*. L. Sturtz, *J*. D. Cogle, *A*. L. Mollah, *W* S. and Bateman, R. J. (1996) Farming systems in the Australian semi-arid tropics -a recent history. *Australian Journal of Experimental Agriculture,* 36, pp.915-28.

Commonwealth of Australia (2003) *Indigenous Business Review: Report on Support for Indigenous Business*. http://www.atsia.gov.au/Media/Reports/PDF/IndigenousBusinessReview_Part1.pdf [Accessed 20 July 2006].

Commonwealth of Australia (2005) *Overcoming Indigenous Disadvantage: Key Indicators 2005*. http://www.pc.gov.au/gsp/reports/indigenous/keyindicators2005/index.html [Accessed 20 July 2006].

Dillman D.A. (2000) *Mail and Internet Survey: The Tailored Design method.* Second edition. John Wiley and Sons: New York.

Freebairn, J. (2003) Economic Policy for Rural and Regional Australia. *Australian Journal of Agricultural and Resource Economics,* 47(3), pp.389–414.

GISCA (2006) *Accessibility/Remoteness Index of Australia (ARIA).* http://www.gisca.adelaide.edu.au/web_aria/aria/aria.html [Accessed 27 January 2006].

Greiner, R., Nursey-Bray, M., Smajgl, A., Leitch, A. (2004) *Multiple use systems in Australia's outback landscape*. Paper presented to the 10th Biennial Conference of the International Association for the Study of Common Property (IASCP), Oaxaca Mexico.

Jackson, J, and Murphy, P. (2006) Clusters in Regional Tourism: An Australian Case. *Annals of Tourism Research*, 33 (4), pp. 1018–1035.

Land and Water Australia (2005) *The Tropical Rivers Program*, Canberra.

Lloyd, R., Harding, A. (2004) *Getting down to small areas: estimating regional income and wealth in Australia using the spatial microsimulation.* National Centre for Social and Economic Modelling, Canberra.

Media M Group (2006) http://www.dame.com.au/

Melhuish, T., Blake, M., Day, S. (2002) *An Evaluation of Synthetic Household Populations for Census Collection Districts Created Using Spatial Microsimulation Techniques*. National Centre for Social and Economic Modelling, Canberra.

Northern Territory Government (2005) *2006-07 Budget: Fiscal and Economic Outlook*, http://www.nt.gov.au/ntt/budget/papers/bp2/economy_overview.pdf [Accessed 17 July 2006].

Pritchard, B. (2005) Beyond the resource enclave: Regional development challenges in northern remote Australia. *Journal of Australian Political Economy,* 55, June, pp.77-93.

Roberts, B. H., and Enright, M.J. (2004) Industry clusters in Australia: Recent trends and prospects. *European Planning Studies*, 12 (1), pp. 99-121.

Stoeckl, N., and Stanley, O. (2004) *Predicting regional and landscape dynamics in Australian Savannas – Economic Dimension.* TS CRC Project Report, October, James Cook University, Townsville, 99 pages.

Stoeckl, N., and Stanley, O. (2005) Land Rich and Data poor: Modelling requirements in Australia's Far North. *Economic Papers,* 24(3), pp.230– 248.

Stoeckl, N., and Lanphier, F. (2005) Can Tourism 'save' other regional businesses? Paper published in the refereed conference proceedings, SEGRA 2005 Sustainable Growth for Regional Australia Conference, Ninth National Conference, Yepoon 5-7 September.

Stoeckl, N. (2007) Regional Expenditure Patterns, Remoteness and Type of Enterprise: Which Tourism Businesses Spend the Largest Amounts within Their Local Communities? *Economic Papers,* 26(1), pp.64-84.

Taylor, E., Harding, A., Lloyd, R., Blake, M. (2004) *Housing unaffordability at the statistical local area level: New estimates using microsimulation.* Australasian Journal of Regional Studies, Vol.10, No.3, pp.279-300.

Taylor, J. (2002) *The spatial context of Indigenous service delivery*, CAEPR Working Paper No.16/2002, http://www.anu.edu.au/caepr/Publications/WP/CAEPRWP16.pdf [Accessed 27 June 2006].

Yellow Pages (2005) http://www.yellowpages.com.au.