Estimating community benefits from tourism: The case of Carpentaria Shire

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Abstract

The small rural communities in Australia's tropical savanna landscapes depend upon the region's natural resources for income and employment. Historically primary industries – including mining, grazing and, in the case of coastal communities, fishing – have been the pillars of economic activity in those regions. More recently, tourism has emerged as an additional nature-based industry, which offers new development and employment opportunities for populations in remote regions. Net benefits from tourism accrue from the balance of economic, social and environmental interactions of tourists with a destination.

This paper presents a model of tourism impact in the Carpentaria shire of North West Queensland. A methodology is developed for tracking and quantifying social, economic and environmental impacts. Data from an in-progress research project are presented and analysed to test the hypothesis that community benefits could be improved without an increase in visitor numbers, by changing the composition of visitors to the region. Interpretations are offered as to how both, sectorial and regional planning and management can effect improved community benefits from tourism.

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Keywords: Tourism impact, net benefit, savanna regions, destination management, host community, grey nomads

1 Introduction

Tourism is one of the fastest growing sectors of the Australian economy. In Queensland, for example, takings from accommodation grew almost 25% in the five years prior to September 2002. Growth in tourism is even more pronounced in the Carpentaria Shire, where takings from hotels, motels, guest houses and serviced apartments increased by almost 40% between the September quarter 2000 and the same quarter 2002 (ABS 2002a).

Tourism is generally promoted as a source of employment, revenue, additional tax receipts, foreign exchange benefits and enhanced community infrastructure (Ko and Stewart, 2002). Yet while there are some clear benefits from an expanded tourism industry in remote regions, there are also some costs – primarily because tourism is dependent on and is a major user of natural resources and biodiversity (Preece et al, 1995). This is particularly true in the savannas, where rapidly increasing visitor numbers are straining resources, the environment, infrastructure, local services and the communities themselves (Collins, 1996).

Based on official tourism statistics, as many as 60,000 tourists pass through the shire during one year[1]. When compared to regions like Cairns, for example, the absolute number seems small. Yet the local impact of tourism is significant, primarily because visitor numbers are large relative to the population base. On census night 2001, more than 60% of enumerated persons in some centres of the Shire were visiting from outside the shire (ABS, 2002b).

Tourism, while generating income, also generates costs. For example, residents are faced with water restrictions during the dry season, which is peak tourist season, to ensure that water is freely available to tourists. Tourists spend much of their time catching fish from the local river and estuaries. Anecdotal evidence suggests that fish stocks are in decline, and congestion in some areas may be lowering use and non-use values of local residents. Further, the local indigenous community, which represents 60% of regional population, has virtually no direct involvement in the tourist industry.

In short, both the net benefit and distributional effects of tourism depend on the way in which visitors interact with the host community economically and socially, and with their environment. Net benefit is not, necessarily, positive. In some tourist regions it is questionable whether the benefit to host communities from the tourists' financial contribution outweighs the social, cultural, or environmental costs (Liu and Var, 1986). Even if aggregate net benefits are positive, the costs and benefits are unlikely to be distributed equally.

Regional planners and managers across the remote regions of Australia who pursue tourism as a source of community benefits must consider net community benefits – ie the *net* financial, environmental and social benefits that are attributable to the tourism industry – while minimising any adverse distributional effects. The Carpentaria Shire in North West Queensland, specifically, is looking to achieve this objective.

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[1] <4% of the 1.3 million domestic visitors to Queensland and <1% of the 777,000 international visitors to Tropical North Queensland (BTR1999; Tourism Queensland, 2002).

The data analysed in this paper were collected during an (on-going) research project seeking to (1) provide decision makers in the Carpentaria Shire with information about the aggregate and distributional impact of regional tourism at a financial, environmental and social level; and (2) develop and assess management options on the basis of the increased understanding of the impact of tourism in the shire.

This paper is organised into six sections. Section 2 serves the purpose of providing relevant background. It presents necessary detail about the case-study area and introduces a conceptual model of tourism development. It also provides a snapshot of the tourist market. Section 3 explains the methodology, detailing how the project went about collecting and analysing data. Section 4 presents some descriptive statistics from each of the 4 surveys that were conducted as part of the research, while section 5 integrates and analyses the data. The conclusion offers suggestions for translating the information and learning provided by this research into regional planning and management actions to increase community benefits from tourism in the Carpentaria Shire.

2 Background

Carpentaria Shire is part of the Tropical North Queensland (TNQ) tourist region. It covers an area of approximately 69,000 square kilometres and has a resident population of almost 4000 persons, 60% of whom are of aboriginal (ABS, 2002c).

There are two main townships within the shire: Normanton and Karumba. Normanton was initially settled as the main port for the Gulf of Carptentaria and was used extensively to transport gold mined in the Croydon area. It has an estimated resident population of about 1200 (ABS 2002c) and is the administrative centre of the local government area.

Karumba, with an estimated resident population of approximately 530 (ABS 2002c) adjoins the Gulf of Carpentaria. In the early part of the 20th century it served as a refuelling base for planes operating between Australia and Asia. In the 1970s it was a key port for the more than 300 prawn trawlers working in the Gulf of Carpentaria. As fishing stocks went into decline, so too did the township. Today, it harbours a modest fishing fleet and serves as a shipping port for live cattle and zinc (from the Century Zinc mine some 400 kilometres south).

In the early 1990s a road into Carpentaria Shire was sealed, which has made Karumba the only location on the Gulf of Carpentaria accessible by bitumen road. This opened the area to mainstream tourism. As predicted by Butler's *life-cycle model* (Butler, 1980), both the number (and type) of visitors to the region have changed substantially over time from the occasional 'adventurer' during the 1970s to the numbers seen today.

Gunn (1994) developed a descriptive model to explain how different forces interact to shape tourism development. In this model, 'supply-side' forces are represented by attractions, transportation, information, promotion and services. How well the forces function depends on organisation, leadership, finance, labour, entrepreneurship,

community, competition, government policies, natural resources, and cultural resources – some of which can be influenced by those seeking to manage tourism. Ko (2001) provided a framework for sustainable tourism development assessment, suggesting that those wishing to assess the sustainability of tourism development need to consider issues from a variety of perspectives.

Integrating relevant elements from these models for the given savanna setting, Greiner et al. (2003a) developed a conceptual model of tourism development and impact (Figure 1) as a guide to planning, investment and management. The shaded variables of the model provide the focus for this paper.

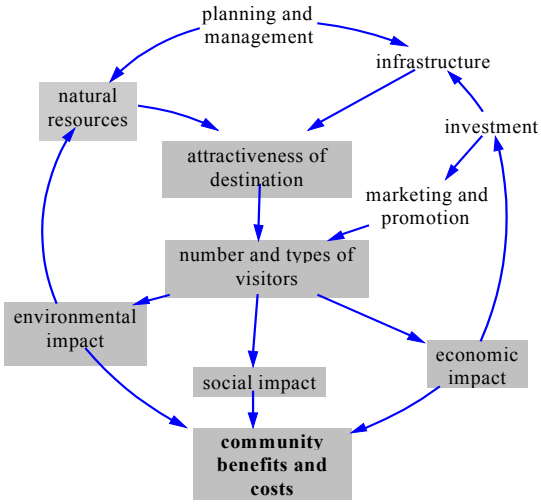

Figure 1: Conceptual model of tourism development and community benefits

The purpose of the model is to define, explain, and describe relationships among key variables. It is not meant to serve as a definitive guide to tourism development, and other models (or other versions of the current model) may prove to be more appropriate in other contexts. The model serves as a roadmap for data collection and interpretation, explicitly identifying the type of information required by those who wish to assess the community benefits of tourism (information about tourism's economic, environmental, and social impact). The next section of this paper discusses the methodology used to collect that information.

3 Methodology

Few of the data to describe the regional tourist system are publicly available. On the resource/environmental issues, data is particularly sparse, although the Queensland Department of Primary Industries (DPI) collects and publishes some data on commercial and recreational fishing in the region. Socio-economic data is mostly limited to that which

is supplied by the ABS census and business surveys. The latter provides an incomprehensive picture. For example, in the case of accommodation places, the ABS (2003) lists data for 3 businesses only for the whole of Carpentaria Shire, with a capacity of 86 rooms. This compares to the inventory in Normanton and Karumba alone, compiled by this research team, of 15 accommodation places with a capacity of 133 rooms/units, 474 (powered) caravan sites and 127 camp sites.

Similarly, there are no sound estimates of tourist numbers available. In the regions there is talk about 95,000 visitors per year, while the BTR national and international tourist surveys suggest up to 60,000 visitors may be visiting the region (see Introduction). These numbers are too generic to be informative at the local scale. In addition, there is no publicly available data about the social or environmental impact of tourists in the region. Consequently, those interested in developing an understanding of tourism in Carpentaria Shire need to generate data through survey activity.

The integrated nature of the issue demands that different types of questions be asked of different agents, using different instruments. The project has completed four different surveys, collecting data on the socio-economic aspects of tourism in the region. Key aspects of each of the four socio-economic surveys are summarised in Table 1.

Table 1: Summary description of survey methodologies

	Visitor survey	Community survey	Business survey	Consumer survey
Target audience	Tourists (visiting parties)	Residents	Business managers	Shoppers (tourist and residents)
Scope	Socio-economic profile, expectations, activities, preferences	Perceived economic, social and environmental benefits & costs of tourism	Employment, business income and expenses, location of transactions	Expenditure on groceries
Design	Lengthy, structured, tick questions, rating questions, number questions, open-ended questions	Lengthy, rating questions, open questions	Lengthy, structured, tick questions, number questions, open-ended questions	Short, structured, tick questions, number question
Data collection	Face-to-face	Face-to-face	Face-to-face	Face-to-face
Stratification method	Tourist seasonality, location, accommodation type	Location, ethnicity, gender, age, profession	Attempt at capturing total population	Shops
When conducted	July 2002, Sept 2002, Feb 2003, April 2003	Nov 2003	Sept 2003	Sept 2003
Sample size	510 travel parties (1400 tourists)	87 residents	24 businesses	128 total; 71 residents 57 tourists

Questions about the motivations of tourists, about how much money they spend and on what items, and about the frequency and type of interactions with the local population and the natural environment are, for example, best addressed through a visitor survey. Information about the importance of tourism expenditure relative to 'local' expenditure is best collected at point of sale. Information about the financial links within the regional economy (and with the 'outside' economy) can only be collected from businesses. And questions about how the host community feels impacted by tourists must be asked of local residents.

As noted by Gelan (2003) differences in the target population, and in the type of information sought (among other things) dictate different methodological approaches. For example, visitor surveys need to be conducted at different times of the year so as to minimise problems associated with seasonality, whereas business surveys do not. These methodological differences are also summarised in the Table 1 – with further details provided under separate sub-headings in section 4.

4 Descriptive statistics and analysis

4.1 The visitor survey

The visitor survey sampled 510 travel parties, representing more than 1400 visitors to the Carpentaria Shire. The sample comprises about 10% of the visitors to the region during 2002/03 (see section 5.1.2 for details on the way in which total visitor numbers were estimated). It established place of residence and socio-demographic profile, duration of stay, visitor expectations and activities. It also gauged visitor preferences for a series of potential new activities and facilities, and willingness of visitors to financially contribute to the management of tourist resources and infrastructure.

On the basis of socio-economic criteria, tourists are grouped into visitor segments. The basis for this grouping is explained in Stoeckl et al. (under review). Table 2 provides an overview of the key visitor segments in relation to composition of travel party and duration of stay. Most evident here is that the market is dominated by Australian retirees, predominantly from southern states. This visitor segment is generally referred to as 'grey nomads'. Cridland (2003) provides a comprehensive analysis of this visitor segment for north-east Queensland.

Not only are retirees (including retired couples and singles) the largest visitor group (44% of parties surveyed), but – because they stay twice as long as the average visitor – they account for almost 70% of visitor days.

Table 2: Travel parties surveyed by visitor segment and combined duration of stay

(Source: Greiner et al. 2003b)

Visitor segment	Number of travel parties interviewed	Persons per travel party	Average length of stay (days)	Visitor days
Total	510	2.7	35.2	48,644
Retired Couples	42%	2.0	76.2	67%
Couples	18%	2.0	37.3	14%
Groups of friends/relatives	13%	4.7	13.8	9%
Family groups with children < 16 years old	13%	4.3	9.2	5%
Singles	6%	1.0	11.3	1%
Family groups without children or with older children	4%	3.5	13.5	2%
Retired Singles	2%	1.0	69.5	2%
Members of tour groups	2%	1.0	7.4	0%
Other	0%	1.0	3	0%

The socio-economic status of visitors, to Carpentaria shire as expressed in income, education and occupation, is lower than that of the general population (Stoeckl et al., under review). This is contrary to the experience reported for visitors to national parks (Knapman and Stoeckl, 1995). Figure 2 shows that across all respondents 48% indicated that their annual household income was below $35,000. In comparison, the national visitor statistics (which reported a 21% 'don't know/refused' response) found that 21% of interstate visitors to Queensland had a household income of below $36,400 while 49% were above $52,000.

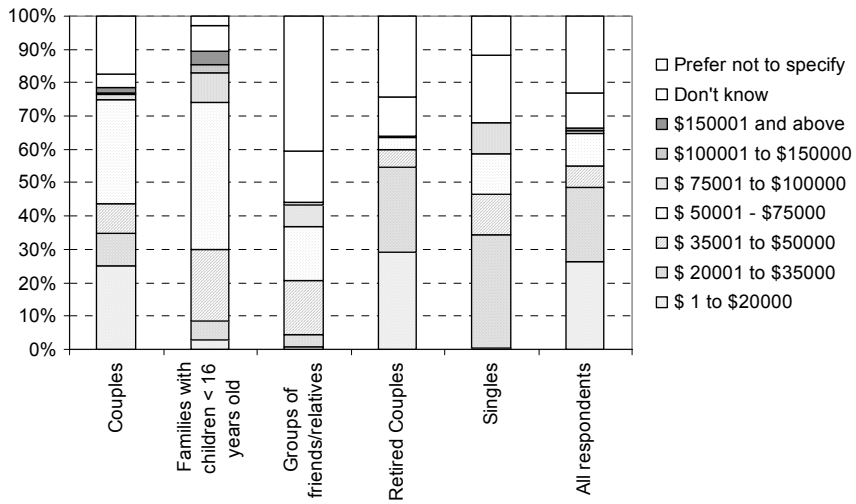

Figure 2: Annual household income by visitor segment by income bracket

The visitor survey also elicited information on the frequency with which different types of visitors engaged in different activities. A post-hoc comparison of means was conducted for all survey variables, the aim being to highlight similarities and differences between visitor segments. The data are described and analysed fully in the paper by Stoeckl et al. (under review).

Table 3 shows the mean daily frequency for a list of activities for each visitor segment described in Table 2. Those means are further characterised by superscripts, which indicate whether activity frequency between visitor segments is statistically significant at the 5% level. The superscripts were established using the Tukey HSD (Honest Significant Difference) test for unequal sample sizes (Norusis, 1995). Identical superscripts are assigned to 'similar' means; means that do not share the same superscript are statistically different.

The range of activities on offer in Carpentaria Shire is limited and the predominant activity is fishing. All visitor segments except singles fish virtually daily. Fishing is most commonly done from boats that tourists bring to the region, from the beach or riverbank (mostly by families), or on fishing charters. Families and groups have the highest propensity to fish (Figure 3), although differences between tourist segments are only statistically significant when compared to singles.

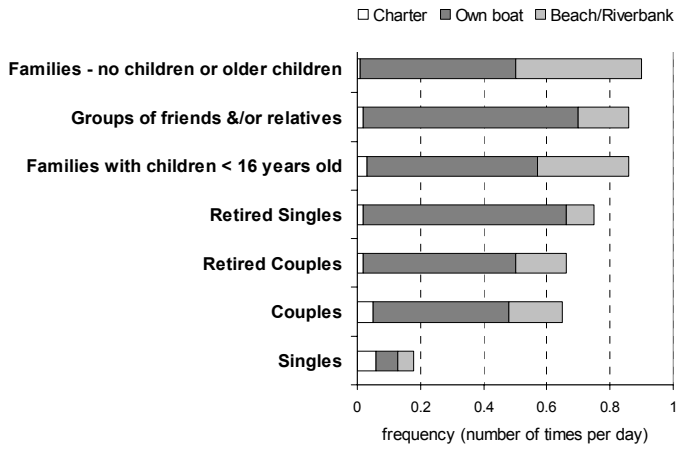

Figure 3: Frequency of recreational fishing by type of fishing and by visitor segment.

(Source: Greiner et al. 2003b)

Overall, visitors to the region tend to be quite self-sufficient – eg. shopping at the grocery stores and cooking meals themselves rather than eating out. Retirees are less likely to eat out than other groups. They spend a larger proportion of time in the caravan park and go out for a drink less frequently than other visitor segments. In contrast, groups of friends and relatives and singles like to go out for a drink. None of the 'typical' tourist activities such as tours are undertaken by any of the visitor segments in large proportions, nor does any visitor segment do much shopping for souvenirs.

Table 3: Visitor segments activity profile as mean frequency of activity undertaken per visitor day

(Source: Stoeckl et al., under review. Note: superscripts based on post-hoc pair-wise comparison of means between visitor segments. Different superscripts indicate statistically significant difference between segment means at 5% level.)

	Retired Couples	Couples	Families without children or with children > 16 years old	Families with children < 16 years old	Groups of friends &/or relatives	Retired Singles	Singles
Activities involving exchange of money							
Stay in caravan park (proportion of groups)	0.93 [a]	0.68 [b]	0.28 [e]	0.44 [cde]	0.29 [e]	0.85 [abc]	0.34 [de]
Grocery shop (times per day)	0.54 [a]	0.38 [b]	0.44 [ab]	0.27 [b]	0.30 [b]	0.53 [ab]	0.19 [b]
Go out for a drink (times per day)	0.24 [a]	0.45 [b]	0.34 [ab]	0.44 [b]	0.60 [b]	0.21 [ab]	0.55 [b]
Eat out (times per day)	0.22 [a]	0.29 [a]	0.27 [a]	0.33 [a]	0.32 [a]	0.32 [a]	0.38 [a]
Purchase souvenirs (times per day)	0.08 [a]	0.09 [a]	0.09 [a]	0.14 [a]	0.09 [a]	0.06 [a]	0.11 [a]
Visit barramundi farm (times per day)	0.03 [a]	0.11 [bc]	0.05 [abc]	0.14 [c]	0.06 [ab]	0.03 [abc]	0.09 [abc]
Go on scenic river tour (times per day)	0.03 [a]	0.06 [a]	0.02 [a]	0.06 [a]	0.03 [a]	0.03 [a]	0.08 [a]
Go on 'Gulf-lander' (times per day)	0.03 [a]	0.03 [a]	0.06 [a]	0.03 [a]	0.02 [a]	0.03 [a]	0.04 [a]
Go on joy-flight (times per day)	0.01 [a]	0.00 [a]	0.05 [a]	0.02 [a]	0.03 [a]	0.01 [a]	0.00 [a]
Fishing							
Fishing on charter boat (times per day)	0.02 [a]	0.05 [a]	0.01 [a]	0.03 [a]	0.02 [a]	0.02 [a]	0.06 [a]
Fishing in own boat (times per day)	0.48 [bc]	0.43 [b]	0.49 [abc]	0.54 [bc]	0.68 [c]	0.64 [bc]	0.07 [a]
Fishing from beach or river-bank (times per day)	0.16 [ab]	0.17 [ab]	0.40 [b]	0.29 [b]	0.16 [ab]	0.09 [a]	0.05 [a]
TOTAL Fishing	0.66 [a]	0.65 [a]	0.91 [a]	0.86 [a]	0.85 [a]	0.70 [ab]	0.17 [b]
'Free' activities							
Cook own meal (times per day)	0.86 [a]	0.71 [ab]	0.76 [ab]	0.66 [b]	0.70 [ab]	0.74 [abc]	0.33 [c]
Go on walk (times per day)	0.64 [a]	0.53 [a]	0.63 [a]	0.63 [a]	0.42 [a]	0.59 [a]	0.52 [a]
Watch birds (times per day)	0.29 [a]	0.30 [a]	0.30 [a]	0.29 [a]	0.18 [a]	0.17 [a]	0.26 [a]
Engage in family activities (times per day)	0.04 [a]	0.06 [a]	0.65 [b]	0.71 [b]	0.11 [a]	0.00 [a]	0.06 [a]

4.2 The consumer survey

While establishing the activity pattern of visitors, the tourist survey did not elicit the amount of money visitors spent on those activities. Instead, it was deemed possible to generate reasonably accurate estimates of the amount spent on accommodation, tours, and meals by combining data from readily available price lists with the 'frequency' data discussed above. This information (and methodology) is presented in section 5.1.2

To gauge the spending on groceries, a supplementary consumer survey was conducted. It was administered at the shops in Normanton and Karumba, asking people their residential postcode, (visitor) segment and amount of money spent for the just completed shopping. Figure 4 summarises mean spending by segment.

The survey shows that family groups spend significantly more per grocery shop than the other visitor segments. However, on the basis of daily tourist spending – taking into account size of travel party and frequency of grocery shopping (from Table 3) – retirees spend on average $6.10 per visitor day on groceries, followed by families ($5.20), singles ($5.00), and couples ($4.40).

Figure 4: Spending on grocery shopping – by visitor segment.

(Source: Greiner et al. 2003b)

4.3 The business survey

To gain a better understanding of the economic impact of tourism, a business survey was conducted. The survey targeted all registered businesses in Normanton and Karumba, which were either directly or indirectly associated with tourism. This included a total of 39 businesses, including accommodation places, pubs, clubs, cafés and restaurants; tour businesses and retail outlets.

To reduce respondent concern over the confidential nature of issues discussed, no questions sought information on dollar values. Instead, business managers were asked about the number of staff employed, the proportion of total expenses attributable to particular inputs, and the proportion of inputs sourced locally, or elsewhere. For the purpose of the survey no distinction was made between resident-related and visitor-related turnover. In total, 27 business managers participated in Normanton and Karumba, equalling a response rate of 68%. Response rates ranged from 53% for accommodation places to 90% for retail businesses.

The survey recorded the employment pattern of businesses. The responding businesses employed 121 people. Employees were predominantly non-family employees and on a full-time basis. Very few employees were indigenous (Figure 5).

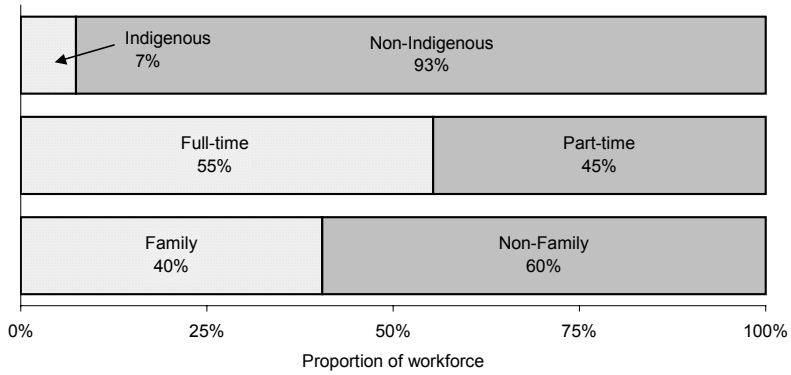

Figure 5: Characteristics of employees in respondent businesses

(Source: Greiner et al. 2003b)

Assuming that the survey sample enables a linear extrapolation of employment to the total number of tourist-related businesses in Carpentaria Shire, there would be approximately 180 persons employed. This estimate relates well to the employment information derived from the 2001 census (ABS 2003), which records a total of 175 persons employed in tourism-related industries, including 76 in 'accommodation, restaurants and cafés', 93 in 'retail trade' and 6 in 'cultural and recreational services'. This accounts for 15.9% of employment in the Shire.

As regards indigenous employment – the ABS estimates that there were 776 indigenous persons employed in Carpentaria shire at the time of the 2001 Census. The business survey identified 9 indigenous employees in the tourism industry. Again assuming that the survey sample enables a linear extrapolation of employment, this implies that tourism accounts for less than 2% of local indigenous employment (14 out of 776).

Employment in tourism is seasonal. The ABS IRDB data show employment varying in the 3 accommodation businesses between 41 persons employed during the peak season (September quarter 2002) and 25 during off-season (December quarter 2001).

Businesses indicate that it is difficult to find employees who have the right skills and are reliable and trustworthy. Some employers are willing to "make do" with employment shortages rather than employing somebody who is not qualified for the position.

All businesses stipulate that they prefer to buy goods and services locally where possible. However, with the exception of banking, the vast majority of goods and services are purchased outside the Shire and outside north-west Queensland (Figure 6). Impediments to increasing local business include unavailability, costs and reliability. About 85% of respondent businesses indicated that their head office is in the Normanton/Karumba region.

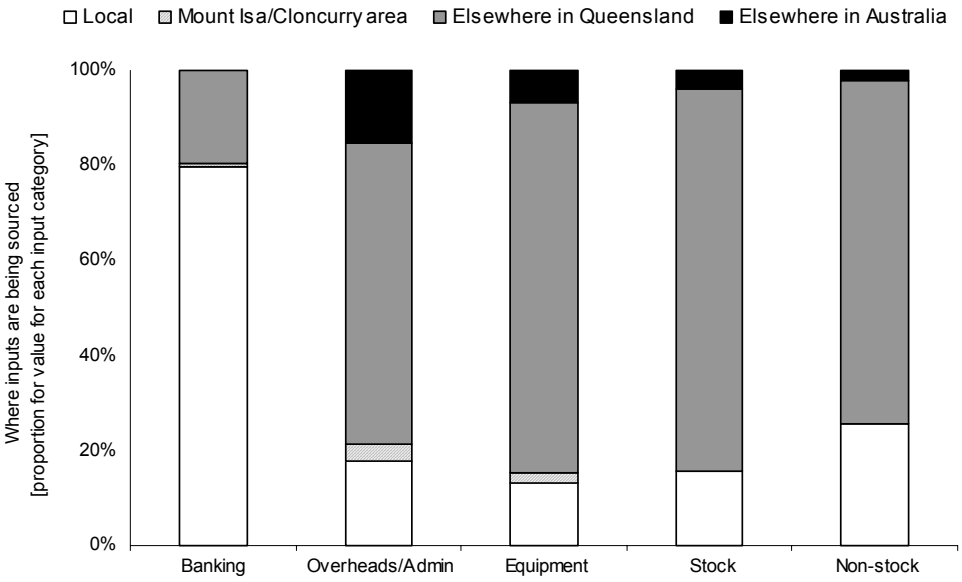

Figure 6: Source of inputs [proportion of value of goods and services sourced by businesses locally and elsewhere – by category]

(Source: Greiner et al. 2003b)

Figure 7 shows how business expenses are distributed across various inputs. The majority of business expenses are associated with the purchase of stocks/inputs/consumables. For 41% of businesses this category accounts for more than 40% of total expenses. The second most significant cost item is labour. The majority (65%) of businesses estimate labour costs to be between 10 and 40% of total expenses. New equipment is a significant item (40-60% of expenses) for 17% of respondents. The vast majority of businesses are reporting business administration, interest payments and non-stock goods and services to each make up less than 25% of total expenses.

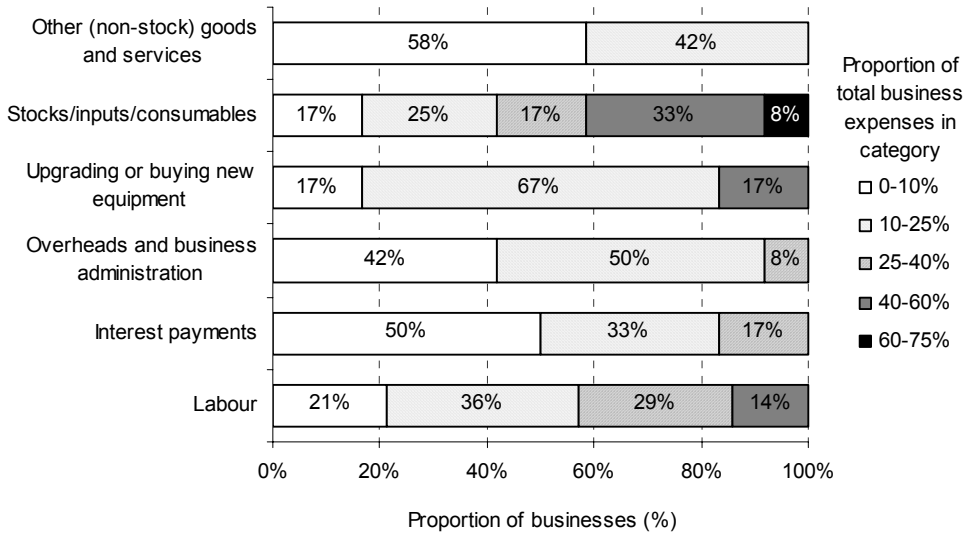

Figure 7: Distribution of business expenses by category

(Source: Greiner et al. 2003b)

The data were tested for statistically significant differences between different types of businesses, specifically businesses in the category 'accommodation, cafes and restaurants' and other types of businesses. However, no significant differences between industries were found. This can be explained by various data issues, including the high diversity of businesses within each industry, the small number of businesses overall and in each category – compounded by incomplete data – and the fact that some businesses were highly vertically integrated (for example including accommodation, retail and tours).

4.4 The community survey

A community survey was conducted to establish how members of the host community perceived impacts of tourism. The data were collected from 73 interviews conducted during November 2003. The sampling sought to include a diverse range of professional people in the shire (26% of sample), including key personnel in the council office, schools and TAFE, hospitals, police, aboriginal organizations and banks. Overall, 59 % of respondents were from Normanton, and 41% from Karumba; 23% of respondents were aboriginal; 58% were female; 37% had lived in the region for less than 5 years and 30% for more than 25 years. Hence, although sample size is relatively small, it represents a diverse and representative cross-section of the community.

The survey did not attempt to rate community attitude and satisfaction, which have been shown to vary depending on, for example, the degree or state of development within host communities (Ko and Stuart, 2002). Instead, respondents were asked to rate the impact of tourism on 29 attributes (8 economic, 14 social/lifestyle, 7 environmental), on a scale from

–2 (large negative impact) to +2 (large positive impact). The quantitative questionnaire for those respondents was further complemented by a qualitative survey.

Figure 8 provides an overview of the mean values of perceived impact for each attribute. It paints a very distinctive picture of tourism impact, with clear economic yet ambiguous social and clearly negative environmental impacts.

The local community clearly identifies positive effects in terms of local employment (despite some competition from tourists for jobs during peak season) and business activity, but also government spending in the region. There is a perceived effect on prices of local goods, as businesses are seen to be collecting a tourist rent.

The host community derives an overall small benefit from social interactions with visitors and the fact that businesses and local government cater for visitors with increased product range and services. However, residents were sensitive to congestion and demands placed by (predominantly retiree) visitors on health services.

Respondents rated tourism as highly detrimental to fish stocks in rivers and estuaries. They also confirmed the anecdotal evidence of tourists straining the drinking water, garbage and sewage systems.

The rating questions were complimented by the questions whether, overall, respondents thought that benefits of tourism outweighed negative impacts. The vast majority of respondents (78%) answered this answer in the affirmative.

The respondents were classified into groups according to location in Shire, ethnicity (Aboriginal – non-Indigenous), location X ethnicity, gender, gender X ethnicity, age, length of residency in the Shire and occupation. The Kruskal-Wallis pair-wise comparison test (appropriate for small samples, where the ‘normality’ assumption may not hold) was used to compare responses across groups – looking for statistically significant differences. This analysis revealed that perceptions of tourist impact were largely congruent across the host community. For example, testing for possible gender differences yielded no result.

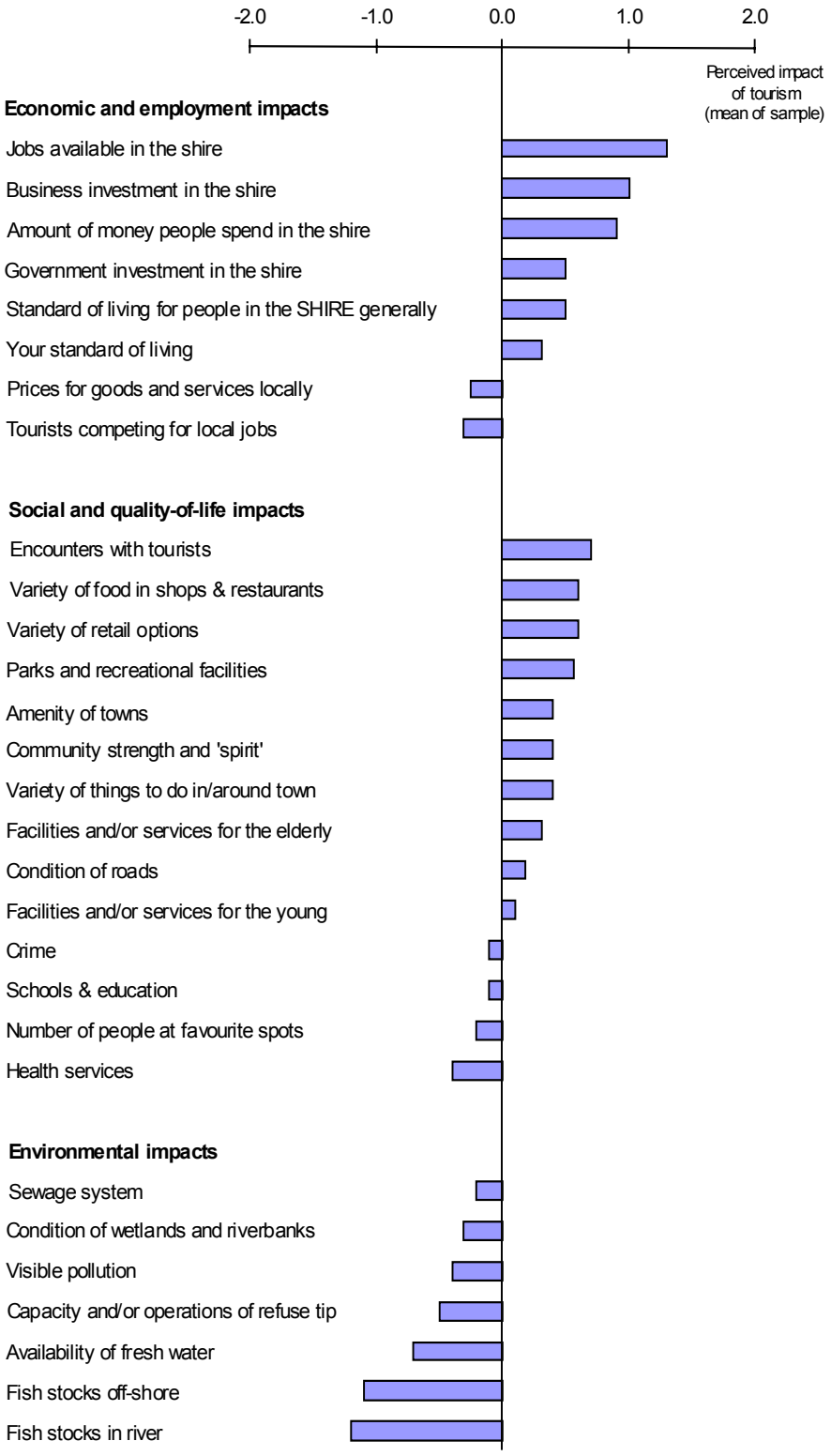

Figure 8: Perceived impacts of tourism in Carpentaria Shire; means of total responses

(note: -2 highly negative, -1 slightly negative, 0 no impact, +1 slightly positive, +2 highly positive)

There were, however, some notable differences. For example, a comparison based on location and ethnicity showed significant differences on some items between the following three groups[2]:

Indigenous respondents (group 1);
Non-indigenous respondents in Normanton (group 2); and
Non-indigenous respondents in Karumba (group 3).

These differences are highlighted in Table 4, which shows the mean response across different groups for several items. The means are characterised by superscripts, which indicate whether the difference between responses are statistically significant at the 5% level. Identical superscripts are assigned to 'similar' means, while means that do not share the same superscript are statistically different.

The analysis indicates that *where* people live in the region has a larger influence on perception of tourism impact than ethnicity. The only true ethnically relevant difference is in relation to perceived impact of tourism on prices of locally purchased goods and services where indigenous respondents perceive a significantly larger negative impact. Nonetheless, these results need to be interpreted with care, particularly in the light of the relatively small sample size and given the cultural differences between interviewers and respondents that could lead measurement error. Overall, aboriginal respondents perceived the economic benefits of tourism to be generally less positive than the non-indigenous respondents from either Normanton or Karumba. They also indicated that impact on their (individual repondents') standard of living was slightly negative, while acknowledging a generally positive effect for the population across the shire. These results are not surprising given the small involvement of the indigenous population in the industry (Figure 5).

As regards location, residents of Karumba generally perceive higher economic benefits from tourism than Normanton residents, and specifically a significantly larger positive impact of tourism on business activity. At the same time, they are generally more concerned about the environmental impacts of tourism, and specifically indicate a much larger negative impact of tourists on fish stocks, drinking water availability and operations/capacity of the refuse tip. They are also more sensitive to having to share their favourite recreational areas with the visitors. These results are not surprising – data from the visitor survey indicates that more than 94% of total visitor days spent in Carpentaria Shire were spent in Karumba – hence residents of that community are more likely to feel the impact of tourism, be it a financial, environmental or social.

[2] There is no 4th group and as there are no Indigenous respondents for Karumba, which has only 2 Indigenous residents.

Table 4: Tourism impact rating by ethnicity by location: mean values

(note (1): superscripts provided only for attribute means where significant differences between respondent groups were detected. Different superscripts indicate statistically significant group means (5%): Kruskal-Wallis test.
(2): unweighted means are provided for each category of attributes for respondent groups as a way of gauging magnitude of impact perceived by category)
(3): overall tourism assessment: 1=benefits>costs; 2=benefits<costs)

	Indigenous	Non-Indigenous Normanton	Non-Indigenous Karumba
Economic and employment impacts			
Jobs available in the Shire	0.76	1.52	1.29
Tourists competing for local jobs	-0.50	-0.33	-0.27
Business investment in the Shire (1)	0.87 [a, b]	0.63 [a]	1.31 [b]
Government investment in the Shire	0.50	0.65	0.40
Amount of money people spend in the Shire	0.53	1.12	0.97
Prices of goods and services locally (1)	-0.76 [a]	-0.07 [b]	-0.10 [b]
Your standard of living	-0.13	0.48	0.24
Standard of living for people in the SHIRE generally	0.31	0.48	0.65
Mean economic impact (2)	**0.20**	**0.56**	**0.56**
Social and quality-of-life impacts			
Health services	-0.50	-0.19	-0.54
Condition of roads	-0.18	0.07	0.48
Schools & education	0.25	-0.23	-0.07
Facilities and/or services for the elderly	0.08	0.68	0.12
Facilities and/or services for the young	-0.07	0.15	0.11
Parks and recreational facilities	0.47	0.74	0.45
Community strength and 'spirit'	0.06	0.44	0.43
Crime	-0.36	0.00	-0.14
Variety of things to do in/around town	0.19	0.44	0.55
Variety of food in shops & restaurants	0.38	0.54	0.79
Variety of retail options	0.56	0.74	0.41
Encounters with tourists	0.29	0.69	0.86
Number of people at favourite spots (1)	0.00 [a, b]	0.20 [a]	-0.62 [b]
Amenity of towns	0.24	0.65	0.29
Mean social impact (2)	**0.10**	**0.35**	**0.22**
Environmental impacts			
Availability of fresh water (1)	-0.60 [a, b]	-0.26 [a]	-1.10 [b]
Visible pollution (eg. roadsides)	-0.13	-0.58	-0.50
Capacity and/or operations of refuse tip (1)	-0.07 [a]	-0.32 [a, b]	-0.79 [b]
Sewage system	0.08	-0.21	-0.40
Fish stocks in river (1)	-0.75 [a]	-1.00 [a]	-1.63 [b]
Fish stocks off-shore	-0.71	-1.05	-1.48
Condition of wetlands and riverbanks	-0.50	-0.09	-0.38
Mean environmental impact (2)	**-0.38**	**-0.50**	**-0.90**
Overall tourism assessment (3)	**1.24**	**1.12**	**1.28**

5 Interpretation and Discussion

This section focuses specifically on the economic and environmental dimensions of tourist impact. Specifically, it integrates data from the different surveys and from other, external sources, attempting to estimate (a) the financial impact of tourism; (b) the 'fishing' impact of tourism; (c) the financial contribution made to the region per tonnes of fish extracted.

5.1 The Economic Impact of Tourism in the Shire of Carpentaria: measures and indicators

The total economic benefit of tourism is generally greater than direct tourism expenditures because these expenditures have flow-on and indirect effects. The impact is generally related to output and employment.

At the national scale, the indirect contribution from tourist consumption is substantial. Salma (2002) estimates that indirect gross value added for the year 2000-01 was close to $26.8 million and therefore slightly larger than the direct gross value of $26.3 million. Indirect tourism employment is estimated to be almost 400,000 jobs, on top of the 550,000 jobs generated directly.

At the regional scale – specifically for small regions – such data are not readily available. Although methods of measuring economic benefits empirically are varied – and far from perfect – many applied studies take the following (very stylised) approach:

- Conduct a comprehensive survey of visitors to estimate average expenditure and use some estimate of total visitor numbers to scale that figure upwards, thereby generating an estimate of total visitor expenditure (E); and
- Use an economic model to estimate the size of the multiplier[3] (κ)
- Calculate the economic impact (I) of tourism as.

$$I = \kappa \times E \qquad \text{Equation 1}$$

There is nothing 'magical' about this approach – other than the fact that it highlights the time of information required by those wishing to estimate the regional economic impact of tourism. The following sub-sections describe how that is done for the Carpentaria Shire.

[3] Multipliers are generated for different measures, most commonly employment and output. Employment multipliers provide information about the total number of jobs (direct, indirect and induced) associated with a particular industry, and output multipliers providing information about the total income/expenditure associated with an industry. This discussion focuses on output multipliers.

5.1.1 Multipliers

Until recently, most empirical studies used static input-output (IO) analysis to estimate regional multipliers (eg. Archer and Fletcher, 1996; Blaine, 1992; Fletcher, 1994; Lundberg et al, 1995; Wanhill, 1994). Nowadays, more sophisticated versions of IO models such as dynamic IO tables and social accounting matrices are available and advances in information technology have made computable general equilibrium (CGE) models a viable and theoretically preferable method of estimating the impact of tourism – because of their ability to allow for 'feedback' effects, and to use other than Leontieff production technology (Woollett et al., 2003; Dwyer et al., forthcoming).

Irrespective of approach – none of these models can generate accurate estimates of multipliers without detailed information about the transactions between the various sectors of the economy (eg. data about each sector's purchases of imports, payments to production factors, level of employment, sales to each of the other sectors, exports, the public sector, and domestic consumption). Not surprisingly, applied researchers confront numerous problems when attempting to obtain such data (Archer 1996), and the problems are further compounded in the case of local and regional studies, where accounts rarely exist at all (as discussed in section 3).

This study does not have the data or resources to support the theoretically desirable approach to estimating the economic impact of regional tourism in Carpentaria Shire (that of developing a region-specific CGE model, into which detailed information on visitor expenditure is fed). Instead, multipliers are approximated using references to values provided in the literature ('authenticated' using information from the business survey).

In the absence of recent and North-Queensland specific data, Table 5 presents output multipliers for industries in the Kimberley region in Western Australia. The purpose is to provide an impression of the size of multiplier values and the relativity between (1) industries and (2) regions of different size. The Kimberley is quite similar to the Carpentaria shire in terms of its geographical remoteness, its focus on natural resource-based industries, and the pre-dominance of self-drive tourism. However, there are important structural differences in the regional economy as well as tourism.

First, tourism in the Kimberley is a different 'product' from tourism in Karumba. Hence one expects different tourism multipliers, since the value of a multiplier is related to the nature of the initial spending. Tourist spending on accommodation, for example, is associated with higher multipliers – due to the high labour content of the product – than spending on fuel or alcoholic drinks, the price of which is largely determined by government taxes and therefore consists mainly of leakage. The Kimberley is, largely a drive-through destination, the average length of stay for domestic visitors being 8.4 days (Kimberley Development Commission, 2003). The share of international tourists is about 15%, which is much larger than Karumba.

Second, the Kimberley is much larger than the Shire of Carpentaria having about 9 times the population. There is an *a priori* expectation, therefore, that the multipliers associated

with industries within the Shire of Carpentaria will be smaller than those in the Kimberley – if only because the leakages must, necessarily be larger (Wall, 1997).

Table 5: Output multipliers for selected industries in Kimberley and comparison to state and national multipliers

(Source: Johnson, 2001: 24, data for 1995-95)

Sector	Kimberley	Western Australia	Australia	Proportion of regional : national
Accommodation, cafes and restaurants	1.51	2.62	3.12	48%
Wholesale trade, retail trade and repairs	1.68	2.05	2.56	66%
Beef cattle	1.37	2.33	2.38	58%
Commercial fishing and aquaculture	1.37	2.05	2.56	54%
Health services	1.68	2.51	2.92	58%
Education	1.75	2.61	3.06	57%
Weighted Average All Industries	1.53	2.29	2.73	56%

For any given industry in Table 5 the Australian output multiplier is larger than the State multiplier, which is larger than the regional one. The general relationship of multiplier with size of the region was statistically confirmed in the meta-analysis of multiplier estimates undertaken by Baaijens et al. (1998), who also found that multipliers were frequently overestimated, specifically in non-scientific documents. One therefore expects multipliers in the Shire of Carpentaria to be smaller than those in the Kimberley, and since those in Table 5 are possibly overestimates, one can be reasonably certain that the Shire multipliers are less than 1.5.

It is possible to validate that assertion using data from the business survey. To do that, note that in the absence of dynamic feedback effects (and assuming that the prices of all goods and services – including wages, interest rates, exchange rates, etc – are constant) regional multipliers (κ) can be calculated as:

$$\kappa = 1 / [1 - \text{marginal propensity to consume locally produced goods and services}]$$

Figure 6 shows that the average propensity of businesses to spend locally, is in the order of 0.20. Using this as an approximation for the marginal propensity to consume gives a multiplier of 1.25. If autonomous consumption is greater than zero, the marginal propensity to consume will be less than the average propensity to consume, and multiplier estimates that are generated in this manner will be too large. We do not have enough data to determine the level of autonomous consumption in the Shire of Carpentaria, but feel that it is likely to be positive. This, coupled with the fact that the above approach neglects dynamic feedbacks, and/or price effects, leads us to believe that 1.25 is an upper bound. In other words, the tourism multiplier in the Shire of Carpentaria is likely to be between 1 and 1.25.

Having established the approximate size of the output multiplier, attention will now focus on estimating tourist expenditure.

5.1.2 Tourist expenditure

Expenditure data was approximated using information from both the visitor and the consumer surveys. More specifically, having sourced estimates of visitor spending – by segment – from tourist businesses in the area, and knowing the frequency of economic transactions (Table 3), duration of stay and mean size of travel party by segment, mean daily spending per visitor could be calculated for each visitor segment.

Table 6 shows estimated mean daily visitor spending by visitor segment and provides a comparison to the estimated mean daily spending for interstate overnight visitors to Queensland.

Three observations are significant. Firstly, daily spending by visitors is substantially lower – by between 44 and 72 per cent – than the Queensland average. Secondly, the variation of daily spending is substantial between visitor segments. Singles spend an estimated $61.63 per day, which is almost double the expenditure of retirees ($30.30). Third, visitor segments spend money on different items. Singles spend almost four times as much on accommodation as retirees.

For most visitor segments, spending on organised tours and other entertainment is the second largest item. Couples spend generally more money on tours and entertainment than any other visitor segment. Specific care needs to be taken in the interpretation of these estimates. They may be over-estimates based on over-reporting of very infrequently undertaken activities in the visitor survey.

The estimated daily expenditure for retirees is about half that estimated by Carter (2002) for retirees. Carter estimated mean daily expenditure of domestic retired tourists to be $67 ($61 for retired caravanners, $49 for retired campers) – or about half the daily spending of all tourist groups of $125. However, retirees stay longer than the average, specifically those retirees who travel by caravan (13.9 nights) or camp (15.1 nights). Given the much longer duration of stay of visitors to Carpentaria Shire and the lower income profile, the above estimates relate well to the national numbers.

While retirees spend less *per visitor day* than any other visitor segment, they spend more *per visit* because they tend to stay in the shire for a long period of time – on average almost 11 weeks on average (Table 7). On a per-visitor basis, retirees spend approximately 6 times as much as a visitor within the segment ‘Families with young children’.

Table 6: Estimated mean daily spending per visitor by visitor segment and expenditure item

(Greiner et al. 2003b and BTR. 2002:27)

Expenditure items	Retired Couples	Couples	Families with children < 16 years old	Families without children or with children > 16 years old	Groups of friends &/or relatives	Singles	Qld mean value for overnight visitors: holiday/leisure (1)
At destination							
Accommodation	$9.47	$11.62	$12.56	$20.31	$11.43	$35.61	$34.54
Groceries for self-catering	$6.09	$4.37	$2.60	$5.21	$2.60	$5.00	$9.55
Restaurant meals & take-away	$1.54	$5.11	$4.51	$5.64	$5.84	$4.94	$20.09
Alcohol and drinks	$0.84	$3.12	$2.37	$2.66	$9.65	$3.82	$8.68
Fuel (petrol/diesel) purchased in region	$4.43	$4.08	$4.78	$4.65	$5.67	$2.63	$13.01
Organised tours and other entertainment	$6.66	$21.20	$12.91	$11.12	$6.63	$7.94	$7.34
Shopping, gifts, souvenirs	$1.25	$1.31	$2.22	$1.87	$1.43	$1.68	$15.90
Total 'at destination'	**$30.30**	**$50.81**	**$41.94**	**$51.47**	**$43.25**	**$61.63**	**$109.11**
Fuel for self-drive from/to residence	$5.17	$11.15	$12.52	$15.03	$9.98	$53.25	
Airline fares						?	$8.33

Notes:

(1) BTR estimates (BTR, 2002:27) are referenced per "visitor night". Total average expenditure per visitor night $136.48. Mean value for fuel does not differentiate between 'travel between residence and destination' and 'at destination'.

Other estimates obtained by multiplying estimated mean value of transactions for items by visitor segment by frequency of transactions obtained from visitor survey and adjusting for size of travel party and duration of stay if necessary. Spending per grocery shop obtained from customer survey conducted. Estimates for other mean amount of transaction calculated from tourist business data. Fuel cost for travel to/from destination estimated on distance basis for 4WD towing trailer.

Table 7: Estimated mean expenditure per visitor in Normanton and Karumba by segment

Visitor Segment	Mean daily expenditure per visitor ($)	Average length of stay (days)	Average total expenditure per visitor ($)	Average total expenditure per travel party ($)
Retirees	$30.30	76.2	$2,308.86	$4,617.72
Couples	$50.81	37.3	$1,895.21	$3,790.42
Families with young children	$41.94	9.2	$385.85	$1,659.16
Families with older children	$41.47	13.5	$559.85	$1,959.48
Groups of friends/relatives	$43.25	13.8	$596.85	$2,805.20
Singles	$61.63	11.3	$696.42	$696.42

To derive at an estimated of tourist expenditure for the Carpentaria Shire, the number of visitors across all visitor segments needs to be calculated. The data from the visitor and business surveys, in principle, provide the foundation for doing that. Two key assumptions are made:

(1) The temporal stratification of the visitor survey, which was administered during four 1-week periods during various tourist seasons (peak – July 2002; spring – September 2002, off-season – February 2003, Easter – April 2003), combined with the stratification across accommodation types, provides a true reflection of the composition of the visitor market during those seasons. The survey forms provide a record of the accommodation type in which the respondents stayed.

(2) The monthly occupancy rates provided by the accommodation businesses provide, in total, a true representation of occupancy rates of various accommodation types across Normanton and Karumba. Multiplied by the total capacity for each accommodation type, room nights occupied can be estimated.

Table 8 shows that while retirees account for 37% of total visitor nights in the shire, the actual number of visitors in that category is only 10% of the total estimated 14,000 overnight visitors to the region. Families with children <16 years are the largest visitor segment, both in terms of estimated travel parties (1165) and visitors (5011).

The estimate of <14,000 total visitors is well below the locally cited number of 95,000 visitors and also well below the potential for 60,000 visitors derived from international and national visitor statistics for Tropical North Queensland. The estimate is, however, entirely plausible as it equates to an occupancy rate of just below 50% for the year across the shire. It is important to note that this estimate does not include the following types of visitors: (1) visitors staying within the Shire but outside Normanton and Karumba, (2) visitors staying with family or friends, (3) special events visitors, such as for the rodeo, (4) commercial tours passing through town and possibly staying overnight and (5) day visitors to the Shire.

Table 8: Estimated visitation to Carpentaria Shire during 2002/03 – visitor nights, number of visitors and number of travel groups: by visitor segment and total

Visitor Segment	Estimated visitor nights	Estimated visitors	Estimated travel parties
Retirees	102,801	1349	675
Couples	44,820	1202	601
Families with young children	46,098	5011	1165
Families with older children	11,496	852	243
Groups of friends/relatives	59,369	4302	915
Singles	10,890	964	964
Other	2,078	281	281
Total	277,552	13,959	4844

Based on estimated visitor nights (Table 8) and mean daily spending (Table 6), the aggregate expenditure of overnight visitors to Normanton and Karumba can now be estimated to be of the order of magnitude of 11.3 million dollars (Table 9), with retirees making the largest contribution of 3.1 million dollars. In comparison, agricultural production in the shire, from livestock disposals, is valued at $31.0 million (OESR, 2002; value for 1998-99).

Adopting the range of 1 to 1.25 for the output multiplier, as explained above, the total economic impact of tourism therefore estimated to be between $11.3 million and $14.1 million.

Table 9: Estimated tourist expenditure for Carpentaria Shire: by visitor segment and total

Visitor Segment	Average daily expenditure ($)	Estimated aggregate expenditure ($)
Retirees	30.30	3,114,428
Couples	50.81	2,277,485
Families with young children	41.94	1,933,593
Families with older children	41.47	591,681
Groups of friends/relatives	43.25	2,567,679
Singles	61.63	672,222
Other	55.88	116,098
TOTAL		11,273,186

5.2 The Environmental Impact of Tourism in Carpentaria Shire

From the host community's point of view, the environmental impact of tourism is negative across all aspects captured in the resident survey (Figure 8). The two major issues, which had emerged anecdotally throughout the research project were: (1) the impact that tourism was having on fish stocks; and (2) the (declining) availability of freshwater for the resident population. We do not, currently, have any 'hard' data on demand and supply of water in the shire. Consequently, our numerical analysis of the environmental impact of tourism focuses on fishing.

Specifically, the visitor survey showed that fishing is the key activity of tourists during their (extended) stays (Table 3) and that fishing is THE major drawcard for visitors to the region (Greiner et al., 2003a). Anecdotal evidence from local residents and responses to the visitor surveys suggest that some tourists may grossly violate fishing restrictions and that anglers may not be catching as many fish recently as in past years. To see whether there was any factual evidence and to estimate tourist related fishing effort, the official fishing and catch statistics from the QLD Department of Primary Industries were obtained and analysed (DPI, 2003). That data covers the past 13 years for commercial and the last 7 years for recreational charter fishing.

The commercial fishery has comprised between 42 and 55 boats per year over the past decade. The catch for 2002 was above average with 540 tonnes, estimated to be worth $2.8 million ($5.16/kg fish). Effort was 3900 boat days.

In terms of recreational fishing, there has been a steady increase of the number of charter boats operating out of Karumba to 14 in 2002. However, the relationship between boats and effort is not linear. Figure 9 shows that angler days on recreational charter boats peaked in 1998 and subsequently declined to below 1800 in 2002. There was a sharp increase in catch per effort (angler-day) during the late 1990s, followed by a declining trend. The proportion of fish released has increased – specifically for Barramundi – along with the average size of fish harvested.

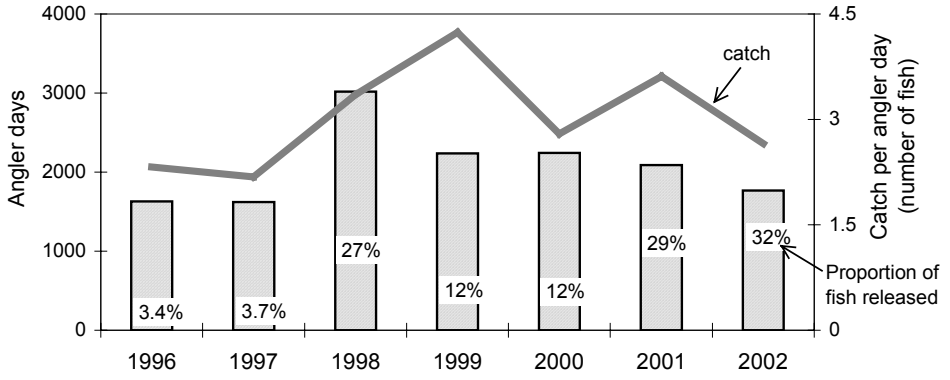

Figure 9: Charter fishing in Carpentaria Shire: angler days, catch and release

(source: Greiner et al (2003b) based on DPI, 2003)

Charter fishing accounts for only a small fraction of recreational fishing effort (Table 3, Figure 3). People fishing from their own boats (and also from the beach) account for approximately 25 times that effort. In the absence of any other data, we have attempted to estimated recreational catch using a combination of DPI and visitor survey data on the basis of the following assumptions ;

1) The rate of catch per effort is related to fishing base: charter = 100%, own boat = 50%, beach fishing = 25%).

2) The rate of catch does not vary between different visitor segments.

3) Each member of a travel group has the same fishing effort and catch.

4) The rate of release of fish caught is equal for all types of fishing and is equal to charter release recorded for 2002.

Based on these assumptions, tourists harvest approximately 384 tonnes of fish per year (Table 10), taking the total annual catch from commercial operators and tourists to 924 tonnes. Retirees have the largest share of catch (121t), followed by groups of relatives/friends (91t) and families (81t).

Given the vague basis of the above estimates (and underlying assumptions), the numbers need to be interpreted with caution. Specifically, there is sufficient anecdotal evidence to suggest that 'true' effort and release rates may vary considerably between visitor segments, which – if substantiated – would significantly influence the estimates.

Table 10: Estimated recreational catch and value

(Note: excludes visitor segment 'other';
*Effort[segment] = recorded daily fishing frequency[fishing base, segment]*rate of catch per effort[fishing base]* mean visitor days[segment]*
*Catch1 = effort * mean catch/effort [number of fish taken]*
*Catch2 = effort * mean catch/effort [weight of fish taken])*

Segments	Effort (angler days)	Catch1 (number of fish taken)	Catch2 - weight (t)	Estimated regional expenditure from Table 9 ($'000)	Estimated regional expenditure per kg fish taken ($/kg)
Singles	1,171	3,001	6	672	$112.00
Couples	13,782	35,236	71	2277	$32.07
Retired Couples	30,840	59,766	121	3115	$25.74
Families with children < 16 years old	17,172	39,772	81	1933	$23.86
Groups of friends &/or relatives	23,747	44,438	90	2568	$28.53
Families - no children or older children	4,081	7,375	15	592	$39.47
Across all visitor segments	90,793	189,589	384	11,041	$28.75

Given that fishing is the single most important drawcard for the destination (Stoeckl et al., under review), it is also interesting to calculate the economic returns to the community per unit of resource extraction. Table 10 shows tourist expenses by segment and calculates $ spent in the region per kg of fish caught. The mean 'value' per kg of fish taken is estimated to be $28.74. This is more than 5 times the comparative value for commercially harvested fish. Estimates show significant variation between visitor segments, being highest for singles ($110/kg), followed by couples and families without children or with children >16 years ($32/kg) and being lowest for families with younger children ($24/kg).

Among the current tourist market, only one segment – namely young single travellers – indicated that fishing was not important to them. All other visitor segments fish more or less daily. Given the high proportion of repeat visitors and the key focus on fishing, a continuation of perceived poor fishing experiences will be the key threat to continued tourism growth in the region, at least in the short term.

5.3 Discussion: Net benefits of tourism

Overall, there is little doubt that tourism brings substantial financial benefit to the region. It is estimated that during 2002-03 approximately 14,000 overnight visitors per year visit the shire, contributing up to $14 million to the regional economy. While these estimates are based on many simplifying, and unverifiable assumptions – and should therefore not be interpreted as definitive – they are realistic and certainly improve upon the prior state of knowledge. For the first time, the Shire of Carpentaria has a sound foundation for tourist planning and estimating tourist impact.

Given the large financial impact it is not surprising to find that the resident population overwhelmingly supports tourism, primarily on the basis of the employment opportunities the industry generates. Tourist businesses (those sectors most directly involved in tourism) employ approximately 180 persons or 16% of the working population..

However, the financial benefits of tourism come at a price. Based on visitor survey data and data obtained from the DPI, recreational catch by tourists could be in the order of magnitude of 70% of commercial catch, and the resident survey indicates that tourism has a large negative impact upon fish stocks in and around Karumba. The resident survey also indicates that tourism has a negative impact upon the availability of fresh water, and generates congestion (viewed negatively) at some or the 'favourite spots' of Karumba's permanent residents. The indigenous residents of Normanton also note the negative impact that tourism has upon the prices of local goods and services (i.e. making them more expensive).

Further, despite the substantial financial benefit attributable to regional tourism, the benefits (and costs) are not evenly distributed – either across the population centres or across ethnical groups. This is most evident when looking at employment – fewer than 7% of those employed by tourist business are of indigenous origin, even though indigenous persons comprise more than 60% of the Shire's population. The financial benefits attributable to tourism are also distributed unevenly across space. More than 94% of total

(surveyed) visitor nights are spent in Karumba. Hence, to the extent that total economic impact is related to accommodation, it is likely that most of the economic impact of tourism occurs in Karumba. These distributional effects were reflected in the resident survey, specifically: the generally less favourable rating on the economic impact of tourism impact by aboriginal respondents; the significantly higher, positive economic rating on the impact of tourism (with respect to business investment) by the residents of Karumba, and the significantly more negative ratings on the social and environmental impacts of tourism (with respect to congestion, fish stocks and fresh water) from the residents of Karumba.

Different types of tourists have different activity and expenditure patterns. Based on the observation of a primarily low-spending retiree tourist market, the primary hypothesis that he paper set out to test was that community benefits from tourism in Carpentaria shire could be increased by changing the visitor market, without increasing visitor numbers. On the basis of the results presented, this hypothesis is rejected.

More specifically, the data highlights the fact that different visitor types make different 'net' contributions to community benefits because they generate different financial and environmental impacts. In some circumstances a change in the visitor mix that holds the number of visitor days constant could generate an increase in net benefits, but this would generally require an increase in the number of visitors. To illustrate, note that:

1. A retired couple spends, on average, more within the regional economy then 6.6 singles, and almost three times as much as the average family (with young children) . Thus, if one were to simply reduce the number of retired visitors, replacing them with an equal number of 'singles' or members of 'families', then the region would experience an economic downturn. To ensure a yield-neutral change in the visitor mix, one would need to replace each retired couple (spending a total of $4600 over 10 weeks) with 7 singles (each spending almost $700 during an 11 day visit) or 3 families with young children (comprising 12-13 individuals each spending almost $385 per day on a 9 day visit). A yield-neutral change in the visitor mix therefore means that more visitors pass through the region. However, it is possible to achieve a higher yield with a reduction in aggregate visitor nights.

2. Retirees are not the segment with the highest resource extraction through fishing. The economic contribution that retirees make to the regional economy on a per-kg-of-fish-take basis is smaller than some groups but larger than others (specifically, families with young children). Hence, a yield-neutral (or yield-increasing) change in the visitor mix may have either a positive or negative impact on the local fishery.

In other words this analysis indicates that a change in the number of visitor nights from the current mix that is dominated by retirees to one with more singles, couples, groups or families with older children could have positive financial but less certain resource impacts.

To re-iterate earlier words of caution, these results have been derived by combining many different estimates (about visitor numbers, catch rates, expenditure, occupancy rates, financial flows, etc) from many different sources (four different surveys including the

DPI's). Some of the estimates – in the case of tourist and resident surveys – are based on relatively large samples and have relatively small standard errors. However some of the estimates have been arrived at by 'deduction', and should, therefore, be treated with considerable caution. These results are thus best treated as 'indicative' – although the main point, namely that net community benefits could be increased by changing the visitor mix (and without changing visitor numbers) is, we believe, robust.

6 Conclusions: Implications for tourism management and planning

Tourism in Carpentaria Shire is unplanned. Tourism development is ad-hoc and focussed in Karumba. The single most important attraction for visitors to the region is fishing – and indeed there are few other activities available for visitors. And while there is no factual back-up for the anecdotal evidence of declining catch, there is great concern about the future of the industry if fish stocks were actually declining. This gives rise to two considerations.

(1) Fishing will remain, for the foreseeable future, the key feature of the tourist product for the region. The fishery requires better management to help safeguard fish stocks and consequently the attractiveness of the region to fishing enthusiasts. This requires integration of commercial and recreational fishing into a joint management plan, improved monitoring and better enforcement of existing fishing regulations including gear restrictions, bag limits, size limits and closures across both fisheries. Further research on fishing behaviour of tourists and residents would be required to gain a more detailed understanding of the recreational fishery in the region.

(2) Diversification of the tourist product holds the key to diversification of the visitor market into non-fishing visitor segments, currently only observed in the 'singles'. The Shire is in the process of re-developing an old warehouse into a tourist information centre and local museum. Other ideas being considered by the council include a bird interpretive centre and a wetlands board-walk outside Normanton, to give tourists better access to the abundant native wildlife. A business person in Karumba is considering the expansion of the barramundi re-stocking farm into an interpretive centre.

A more diversified tourist product might entice some of the current day-visitors in the region – specifically to Normanton – to stay overnight and might also entice a quite active but unquantified tour market into extending their stay in Normanton from over-night only to include some day time activities.

The large aboriginal community in the shire is almost entirely disconnected from tourism and therefore largely cut off from the economic opportunities associated with tourism. There are not only no indigenous tourist businesses, there is not even a relationship through the manufacture and sale of arts and crafts products or paintings. Talks have been initiated

about aboriginal involvement in the visitor information centre. There are also cautious voices raising ideas about aboriginal interpretive walks and river tours.

The critical question here is whether visitors would be embracing of such new activities/facilities if they indeed existed. To that effect, the visitor survey gauged interest in a series of potential attractions. Preliminary results (Greiner et al, 2003a) show that support is varied by attractions and visitor segments. There might be a niche market for aboriginal activities, but that will require better integration of indigenous aspirations into mainstream planning and further research. Generally, families and (non-retired) couples are the segments most seeking to undertake additional activities during their stays.

Some of the environmental problems, such as the perceived excessive use of drinking water by tourists for the purpose of washing boats and cars could be alleviated by charging businesses for the supply of water on a volume basis and introducing coin-operated boat wash facilities. Specifically among families, there is a clear willingness to make a financial contribution to the better environmental management of the region (Greiner et al, 2003a).

Business owners and managers clearly indicated that they are faced with labour shortages. To better take advantage of tourism-related employment opportunities it would seem necessary to up-skill the local population.

The Carpentaria Shire is part of the Tropical North Queensland tourist region. The focus of tourism in that region is clearly on Cairns and surrounding areas. The shire is located along the 'Savannah Way', a route running from Cairns to Broome, which is marketed as a travel experience. There is also a recently developed north-west Queensland tourism strategy, which seeks to better integrate a number of shires in that broader region to enable branding of the region as a stand-alone destination or worth-while stop-over for east-west travellers.

Tourism is a fast changing system. Tourist activity needs to be monitored on a regular basis for ongoing planning and management purposes.

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