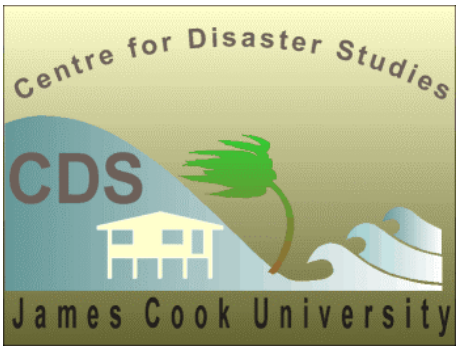

Cyclone and Natural Hazard Vulnerability in Remote and Indigenous Communities of North Queensland

Final Reports

Centre for Disaster Studies
James Cook University

Emergency Management Australia

May 2001

Cyclone and Natural Hazard Vulnerability in Remote and Indigenous Communities of North Queensland: Final Reports

Centre for Disaster Studies, James Cook University

Sponsored by the Commonwealth Government Through the Emergency Management Australia (EMA) IDNDR Projects Program.

Reports were compiled by David King, Alison Cottrell, Linda Anderson-Berry, Scott Cunliffe, Colin MacGregor, Eddie McLachlan and Jane Antrobus

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Background to the Project

Researchers in the Centre for Disaster Studies have carried out extensive studies of community vulnerability to natural hazards and natural disasters. The centre has also carried out post disaster studies within the remoter parts of North Queensland. These have been the Cloncurry floods of 1996, the Gulf River floods in 1997 and the impact of cyclone Rona in 1999. These studies suggested that a level of endemic vulnerability existed within the remote communities of outback Queensland. Additionally, members of the centre had previously been involved in other studies of the outback that were oriented towards development, sustainability, planning and demographic issues. An general awareness of the problems of the region suggested that vulnerability in outback communities may be greater than in coastal settlements.

At one level this greater vulnerability may seem obvious. The area is vast. Great distances separate the small and isolated settlements of the northern savanna region. Rural population density is very low; concentrations of a handful of people on cattle properties that frequently exceed a million acres. Many of the small towns and service centres only contain a couple of hundred people. While main highways are sealed they are often low lying and easily cut by floods. All minor roads are unsealed and may be washed out completely in times of flood. Places are isolated by sheer distance, but during the wet season they are easily cut off completely. Heavy monsoonal rain, coupled with even heavier storms associated with tropical cyclones, flood extensive areas of the north from November to April. Except for air transport some places are cut off for all of the wet season, while for other stations and communities the total isolation may be intermittent. At the same time the region continues to lose some of the little population it holds on to, with a concomitant decline in services and facilities.

On the other hand, a great myth has been created around the outback and its inhabitants. Both the region and its people are portrayed as larger than life. The myth presents the people of the outback as more competent than the rest of Australia in dealing with the harshness of the land and its numerous hazards. The myth is virtually as old as European settlement in Australia and continues to be exploited as strongly as ever. Part of that appeal and mystique has been translated very successfully into tourist campaigns to lure travellers into what is otherwise an economically depressed region. The same myth equally ignores the social problems of indigenous communities, creating an assumption that aboriginal people are so much in tune with their land that they thrive in it and are immune from its dangers. Many of the residents of the outback, indigenous and non indigenous, contribute quite easily to their own legends, and happily embellish the myth. Thus the outback is a very dangerous place for careless city folk, but a paradise of opportunity and great beauty for those who live there.

A great deal has been written about the mythical outback, our need to create it in our own minds, its significance spiritually, in art and in philosophical meaning. This is not the place to review that literature. Rather we must be aware of the distortion it gives to understanding the vulnerability of the people who live in the outback. The place is neither paradise nor hell on earth and most of its people are as vulnerable to natural disaster as the rest of us.

Against this background of the vulnerability of the region, the Centre for Disaster Studies was encouraged by Queensland Health to become more involved with remote and indigenous communities. The centre therefore made two separate but linked research applications; to EMA for IDNDR funds and with Queensland Health as an industry partner, a bid to the Australian Research Council for a PhD scholarship to begin with this project and thence extend it.

There were five main aims to the IDNDR funded research project:

?? the creation of a history of cyclones in each community, recording the positive virtues of this experience alongside the description of the events, the impact and recovery, and through these accounts provide a reminder to the community of the danger and power of these events;
?? the measurement of vulnerability based on census and building characteristics, indexed against coastal cities for comparative purposes;
?? the measurement of household awareness and preparedness, with special attention towards cultural values;
?? collection of community strategies for protection, evacuation and recovery and relating these to the vulnerability, awareness and preparedness surveys;
?? to promptly return to the community the results of the surveys in order to assist that community in assessing its strengths and weaknesses in dealing with future cyclone threats, thereby improving its ability to mitigate against disaster and reduce or control vulnerability;
?? to develop a methodology for awareness and preparedness planning and education that may be offered as a template to other remote and aboriginal communities.

While successful with both applications, the funding periods for each grant meant that the scholarship became available halfway through the IDNDR funding period. It then took much longer than expected before an appropriate PhD candidate was found. He participated in the fieldwork, but we were not able to progress as quickly as we had hoped in gathering community data in the Gulf communities. This research is ongoing, but this specific IDNDR project could better be described as a scoping study for the larger PhD research which has commenced.

The research diverged from the original application, but has achieved most of its goals in a different setting, and with different emphases. Two sets of issues came to dominate the study and have driven it in a different direction to that which we planned.

The first issue is the principal theme of this first report on the broader Northern Queensland experience (including the Gulf lowlands). The bush or outback is so chronically starved of services, facilities and infrastructure that specific awareness and preparedness for hazards and disaster vulnerability is insignificant alongside vulnerability to a lack of services. The lack of services makes the population of the region far more vulnerable to hazards than any lack of awareness and preparedness on their part. This was the overwhelming message that came in all places that we visited. Inevitably it overlies a deeper lack of preparedness, but not necessarily to the specific hazard risk or cyclone or flood. This therefore has become the primary emphasis of the first report.

The second issue was our involvement with the community of the Bloomfield Valley. This developed so strongly that we found that it took half of our time and resources and much more directly met the aims and goals of the original research application. The involvement with the Bloomfield community began with a post disaster visit following cyclone Rona in 1999. Meetings with members of both the indigenous and non indigenous communities generated an interest in reducing their vulnerability. Thus as the Centre for Disaster Studies submitted the IDNDR application to EMA, a member of the community, Alf Craig, submitted his own application addressing hazard awareness and preparedness. EMA supported his application on the condition that he worked with the Centre for Disaster Studies. However there was some uncertainty concerning the extent to which he spoke for the different communities in the valley. The director of the centre had an opportunity to meet with Mr Craig in September 1999 when accompanying Wayne Coutts of the Queensland Department to a disaster planning meeting at Wujal Wujal aboriginal community. Discussions with the Wujal Wujal council members suggested that Mr Craig's survey may not have been supported by either the indigenous or the non indigenous community.

The Bloomfield valley is a deep and scenic valley north of the Daintree tourist developments and the national park, and south of Cooktown. It is not isolated by distance in the same sort of way that the outback towns to the west are isolated and remote. The Bloomfield River is the boundary between Douglas Shire to the south and Cook Shire to the north, and is thus at the extreme end of each shire. It is linked tenuously by a controversial track through the Daintree forest to Cape Tribulation in the south. This track is only passable for about six months of the year. The only other route down the coast from Cooktown is open for a much longer part of the year. Wujal Wujal is sited beside the river and acts as a central place and service centre for the whole community. The Bloomfield Report outlines the extent to which this small population of about 900 people is isolated and remote. Thus while we had not considered the coastal communities as remote locations when making the original application, it became obvious to us that Bloomfield was just as isolated and remote as any other outback community.

At the September meeting in Bloomfield Mr Craig suggested that he might soon be leaving the area and agreed to the Centre for Disaster Studies taking over the research project that he had initiated. This was acceptable to EMA and agreed to by October 1999, by which time the Daintree track was already impassable and the wet season had begun in the wet tropics. Fieldwork was therefore delayed until the next dry season, with EMA approval. After the main fieldwork period in September 2000, communications continued intermittently with the Bloomfield community over the wet season as versions of the community report were sent to the community organisations for their approval and additions.

Thus the remote areas project shifted emphasis from just the Gulf to a much broader consideration of remote North Queensland and much greater emphasis on the issues and problems of infrastructure, services and communications, rather than awareness and preparedness.

VULNERABILITY TO NATURAL HAZARDS IN SMALL AND REMOTE COMMUNITIES OF NORTH QUEENSLAND

Awareness And Preparedness For Natural Hazards – An Extension Of Everyday Lives

This volume reports on a number of case studies of communities in Far North Queensland in terms of their vulnerability to and awareness and preparedness for natural hazards.

It is clear from these studies that the vulnerability of a community to natural hazards depends not only on their location in areas susceptible to cyclones, flooding and fires, but also on the capacity of the community to meet its day to day needs. This conclusion is consistent with findings reported in the international literature on hazards (David et al, 1999; Hewitt, 1997; Mitchell, 1999).

Whether we are discussing the plight of developing or developed countries, the general view now appears to be that complimentary technical and socially oriented solutions to the vulnerability of communities is what is required. Most significantly, the suggestion is that the capacity to deal with hazards is increasingly seen as coming from the vulnerable communities themselves. Consequently, while we can make a general observation that the people who are vulnerable to hazards are those who have the least in terms of social and infrastructure resources, there is no recipe for solving their problems. The capacity to which infrastructure needs can be met will depend on the rate base of the community or the preparedness for state and federal governments and insurance companies to become involved.

The consequences of a disaster for communities is no longer considered to merely one of damage to infrastructure (Kerry et al, 1999; David et al, 1999; Hewitt, 1997). Although damage to transport services, buildings and telecommunications are indeed important, and they can be relatively easily measured in terms of monetary costs. There are other costs to the communities affected by hazards. Vulnerability is not evenly spread within communities. The poor, the aged the very young and the physically and mentally infirmed are the most vulnerable. The community itself is vulnerable as a whole if the hazard experienced is of a large enough scale to break up the community. It is also important to be mindful that dealing with the immediacy of an event is not the only impact of a hazardous event, but the immediate and the longer term recovery phases are also very important Friedman, 1994; Enarson and Scanlon, 1999).

There are some basic information issues that need to be addressed. Communities in the region need to be mapped physically and socially. Unfortunately, census data are not reliable for these purposes, and can only provide best estimates. Communities need to help generate relevant maps of their communities in terms of the places and people who are vulnerable to their particular hazards.

For many of the communities in Far North Queensland, being isolated during a wet season is a normal course of events for which they need (and in the main do) to prepare. In the circumstances of a hazardous situation, the opportunity for assistance

form outside is near to impossible in many cases. The resource base of local governments in remote communities in not sufficient to provide the infrastructure development that is necessary. Regional and Federal Governments are unlikely to be prepared to meet the cost of making a road network that is ' all weather' in the region. The time by which other services can be activated is likely to be too late for emergency situations. In this context the community itself has to be sufficiently resourced to enable it to act on its own accord. Already these communities ' battle through' and many feel that it is more by good luck than good management that tragedies have not occurred more frequently. People feel they have insufficient training to enable them to effectively deal with emergencies and hazards.

Rather than taking a prescriptive approach, in these circumstances communities are best assisted to work out ways to help themselves (Hewitt, 1997; Handmer, 1999). It is very important not to overlook the needs and priorities of those being affected by hazards.

Contemporary discussion is now focussing on helping to generate ' Disaster-Resistant Communities' (David et al, 1999)by utilising human resources within communities to continually assess and monitor their communities vulnerability and capacity to respond to natural hazards. There is also the view that a less paternalistic view of the capacity of ordinary citizens is necessary to enable government organisations to cede control of disaster events to local people who have been appropriately trained (Kerry et al, 1999). This however, does not mean ceding responsibility without appropriate resources (Whitney and Lindell, 2000).

Methodology

Research was carried out in the field and from secondary databases. Fieldwork comprised two preliminary visits to Wujal Wujal and the Bloomfield community, followed by an extended period of surveys and interviews, and numerous communications by phone and email as well as meetings in Cairns with Bloomfield community members. One preliminary field trip was made through the Gulf, as far as Borroloola, and separately to Kowanyama, followed by a longer data gathering research trip to Normanton, Karumba and Burketown. Borroloola was excluded because of its administrative complications and to simplify our coverage within North Queensland. Kowanyama was tackled in a separate successful research bid made by Jim Monaghan, a colleague, on behalf of Kowanyama and Pompuraaw councils for funds to carry out a disaster mitigation strategy.

Qualitative data and information were gathered from key informants in all places visited by the research teams. A start was made to the process of gathering stories and histories of hazards and extreme events. The original application was over-ambitious in its expectations of what could be achieved in work with the communities in the time and funding available. The newly arrived PhD student, Eddie McLachlan, began the process and discovered that it was to be long and slow. Within this research project his achievement was that of making contact, beginning to build a relationship, and identifying and meeting key informants and community leaders with whom he will work extensively over the next two years. The IDNDR project has initiated this aim of the research, but has not yet amassed a meaningful body of research. This will be achieved, in the Gulf communities, including Mornington Island and Doomadgee as well as Burketown, Normanton and Karumba, with the fieldwork funded by Queensland Health, and expected to be completed by late 2002.

Secondary data were collected for the population characteristics of the small and remote towns of the whole of North Queensland, and all infrastructure, services and facilities for a selection of small towns. The research aim was to carry out a measurement of vulnerability based on census and building characteristics, indexed against coastal cities for comparative purposes. At the time of writing this aim in the application the Centre was involved in the early stages of a review of the methodology used by AGSO in its multi hazard assessments of Cairns and Mackay, and beyond. The initial outcomes of the multi hazard assessment suggested exciting possibilities in linking assessments. This research project hypothesised that the small and remote centres are severely disadvantaged in relation to coastal and large settlements, and attempted to identify socio-economic and infrastructural characteristics that could be indexed against AGSO's multi hazard assessment of Cairns.

This aim proved not to be possible. Granger (1999) argues against doing this sort of linking anyway. He compiled data for a specific city in order to point to the most vulnerable communities within the city, and states that comparisons should not be drawn directly or statistically with other places. His methodology ranked all of the characteristics in five groups, using some measures, such as the SEIFA indexes that are aggregated at a higher geographical, but are distributed as the same value to all Census Collection Districts that fall within the same higher level boundary. It was impossible to take the same sets of characteristics for the remote centres and join them

on to either the Cairns Collection Districts or the Mackay ones. Some of the variables do not exist at all at the level of the small town, and many services and infrastructure are entirely absent or on so different a scale that comparison is totally distorted.

A selection has been made of characteristics that are more relevant to the small outback settlements to show how qualitatively they are disadvantaged and thus vulnerable to hazards. The first dataset is derived from the Australian Bureau of Statistics 1996 census Cdata96. The ABS defines some of the small centres as towns, or Urban Centre Localities, but many of the others are located as tiny dots that define them as separate Collection Districts. Having physically visited every one of these dots on the map as part of earlier research projects on the small towns of Northern Australia, it was possible to search for them on the ABS map (they do not show up until a very small scale is set and bear no resemblance to the actual size or scale of the settlement) and select them into a joined database along with the defined urban centres.

Several small places are still not defined, such that their populations are included in the larger surrounding rural Collection District. Examples of places that are missing are Coen and Laura in the middle of Cape York Peninsula, but more significantly for this report is the absence of half of the Bloomfield community. Wujal Wujal is identified in the database, but it is only the aboriginal community. The non indigenous population on the north bank of the river is included in the larger collection district that extends to Cooktown, while the people on the south bank are in the collection district that extends south of Cape Tribulation. The database only includes the concentrated settlements, and not surrounding rural populations, who are in fact even more vulnerable and inaccessible to services.

The census is the best database we have, especially for the remote places. It simply must be used with an awareness that population characteristics have been aggregated and that all places are not necessarily identifiable. There is a further problem, common to most national censuses that some minority groups are undercounted, because of things such as mistrust of government, homelessness, or even extreme mobility. Indigenous people are such a group in Australia. For example, a population count of Cape York Peninsula in 1994 showed a significant undercount of Indigenous people in the 1991 census (King 1994). This is not a fault of the census, but rather an inevitability in a vast and rugged land that is populated by people of a very different culture.

The second database that is presented here is an inventory of services, facilities and infrastructure in eleven selected North Queensland towns. This was carried out shortly before the IDNDR project commenced, by Colin MacGregor under the supervision of D.King, Director of the Centre for Disaster Studies, and funded by the Tropical Savannas CRC. Once it was acknowledged that it was not feasible to replicate Granger's AGSO inventory of infrastructure in Cairns and Mackay, MacGregor's inventory is not matched in the region and illustrates the lack of services that was reported to us by all informants.

Natural Hazard Vulnerability in Small and Remote Towns in North Queensland

The overwhelming message from all key informants in the Gulf communities concerned the problems of limited services and facilities, exacerbated by distance, remoteness and a harsh and variable climate. This tallies with the findings of the centre's earlier post disaster analyses of Cloncurry and the Gulf Floods (Goudie & King 1997, Berry 1998). However, we also observed, then and now, that an underlying vulnerability arose from the socio-economic characteristics of the populations of the small and remote towns.

Most of the small and remote towns are listed in the following sets of tables and maps. As indicated in the methodology section, some places are not identifiable and populations in peripheral collection districts are excluded. It is also likely that the indigenous population is higher than the census figure indicates. The 34 places listed in the tables are most of the towns of the region. Mt Isa, being a mining city, is not included. The southern boundary of the selection of towns is the approximate limit of the savanna region. To the south of this region, the cattle industry becomes even more significant, and the indigenous population declines.

Many of the places listed are indigenous settlements with only a small non indigenous service population. Others are 'open' towns where the indigenous population is often significant or in the majority. The indigenous communities have their own councils and are funded through ATSIC, while the open towns are part (most are headquarters) of a larger rural shire that is reliant on a small rates base for much of its funding of infrastructure.

Figure 1 shows the location of the towns that are listed in the following tables. A few of the places have been moved away from their actual location, principally the four towns at the tip of Cape York Peninsula, and Napranum, in order to enhance the thematic maps that follow. Charters Towers is the largest town out of this group, and being only 130 kilometres from Townsville it is not really remote. However as a cattle and mining town it shares many of the characteristics of the other places of the region. A series of maps and tables follow that illustrate some of the issues of socio-economic disadvantage within the region. A brief discussion accompanies them to emphasise the main points. Tables 1 to 10 and figures 1 to 11 are all derived from the database that is appended in Appendix A.

Table 1 and figures 2 and 3 show the total population and the numbers and proportions of children. The total populations are small. The official definition of a town is that it contains more than 1,000 people. Only 10 of the selection fall into that category, and with the exception of Charters Towers they do not exceed 3,000. Granger has argued that the single most important vulnerability indicators are location in a hazardous location and total population. All analysis of his data confirms this basic premise. However, the very smallness of the remote centres (while reducing overall vulnerability because of a lack of population) increases the vulnerability of any individual, because such tiny population concentrations simply will not support a range of services. Meanwhile all consumable items, especially food and building materials are significantly more expensive than in coastal locations. The other population issue illustrated is the number of children, especially in the indigenous

communities, and that fact that 0 to 4 year olds outnumber 5 to 9 year olds in most places.

Table 1. Small and Remote Towns of North Queensland: Total Population and Young and Elderly

	Total Population	Aged 0-4 years	Aged 5-9 years	Aged 10-14 years	Aged 65 & Over
Aurukun	778	96	90	81	22
Bamaga	756	117	94	53	37
Ravenshoe	406	44	41	38	36
Burketown	220	26	23	11	13
Camooweal	258	16	25	12	42
Charters Towers	8893	662	606	922	1255
Chillagoe	193	33	13	6	9
Cloncurry	2459	247	228	181	211
Collinsville	2021	176	167	162	241
Cooktown	1411	83	96	86	187
Croydon	223	19	21	18	25
Dajarra	203	34	28	33	3
Dimbulah	429	31	35	36	66
Daintree	142	3	6	9	9
Georgetown	298	13	21	13	36
Glenden	1329	142	127	116	9
Herberton	994	78	77	132	140
Hughenden	1444	122	143	79	149
Injinoo	337	41	49	38	6
Julia Creek	519	49	47	21	46
Karumba	1043	32	44	37	191
Kowanyama	912	93	98	80	43
Lockhart River	504	58	57	50	9
Doomadgee	754	95	105	74	26
Napranum	777	84	79	67	35
Normanton	1328	134	148	107	105
Pentland	200	15	18	12	40
Pormpuraaw	84	3	0	3	3
Richmond	733	69	65	45	77
Seisia	276	48	44	27	12
Thursday Island	2483	282	273	282	129
Umagico	231	37	35	25	3
Weipa	2200	219	238	159	30
Wujal	293	41	33	18	24

Source: Cdata96, ABS

Table 2. Small and Remote Towns of North Queensland: Young People and School Attendance

	Aged 5-9 years	Aged 10-14 years	Primary School	High School	% of 5-14 year olds in school
Aurukun	90	81	134	14	87
Bamaga	94	53	97	40	93
Ravenshoe	41	38	59	22	103
Burketown	23	11	26	0	76
Camooweal	25	12	23	9	86
Charters Towers	606	922	902	1121	132
Chillagoe	13	6	18	6	126
Cloncurry	228	181	289	103	96
Collinsville	167	162	210	133	104
Cooktown	96	86	123	54	97
Croydon	21	18	29	3	82
Dajarra	28	33	50	0	82
Dimbulah	35	36	58	21	111
Daintree	6	9	8	11	127
Georgetown	21	13	29	0	85
Glenden	127	116	163	102	109
Herberton	77	132	99	195	141
Hughenden	143	79	172	65	107
Injinoo	49	38	51	23	85
Julia Creek	47	21	49	6	81
Karumba	44	37	61	6	83
Kowanyama	98	80	82	34	65
Lockhart River	57	50	74	7	76
Doomadgee	105	74	104	18	68
Napranum	79	67	66	36	70
Normanton	148	107	169	32	79
Pentland	18	12	22	0	73
Pormpuraaw	0	3	0	0	0
Richmond	65	45	74	24	89
Seisia	44	27	34	4	54
Thursday Island	273	282	324	230	100
Umagico	35	25	17	6	38
Weipa	238	159	289	93	96
Wujal	33	18	43	6	96

Source: Cdata96, ABS

Table 3. Small and Remote Towns of North Queensland: Age Left School

	Left School Before 15 Years	Never Attended School
Aurukun	63	0
Bamaga	28	3
Ravenshoe	34	6
Burketown	17	0
Camooweal	35	11
Charters Towers	790	55
Chillagoe	22	8
Cloncurry	191	13
Collinsville	231	9
Cooktown	115	9
Croydon	26	7
Dajarra	9	15
Dimbulah	35	3
Daintree	10	0
Georgetown	46	3
Glenden	136	0
Herberton	82	3
Hughenden	125	7
Injinoo	15	0
Julia Creek	50	0
Karumba	133	5
Kowanyama	74	25
Lockhart River	34	4
Doomadgee	71	12
Napranum	62	4
Normanton	144	28
Pentland	20	4
Pormpuraaw	3	3
Richmond	52	3
Seisia	6	0
Thursday Island	88	16
Umagico	5	0
Weipa	158	0
Wujal	36	10

Source: Cdata96, ABS

Educational facilities are limited in many of the remote areas and the costs of sending children out to high school are increasing while subsidies have relatively decreased. A number of state schools go to grade 8, requiring children to leave the community to pursue high school education. Many do not. Table 2 and figure 4 illustrate this problem. The number attending school should be higher than the population of 5 to 14 year olds (Charters Towers is particularly high because of its boarding schools). In many places, however, and especially some indigenous communities, only a proportion of the 5 to 14 year age group is attending school. This situation will clearly

exacerbate community skills deficits and contribute towards high rates of unemployment or partial unemployment, illustrated in figure 5 and table 4.

Table 4. Small and Remote Towns of North Queensland: Labour Force Participation

	% in Full Time Employment	% in Part Time Employment	% Unemployed
Aurukun	40.8	56.0	2.1
Bamaga	54.3	31.3	7.7
Ravenshoe	43.7	21.4	32.5
Burketown	69.1	27.2	3.7
Camooweal	53.3	26.2	15.6
Charters Towers	64.0	24.9	8.8
Chillagoe	62.2	23.2	14.6
Cloncurry	67.9	20.0	9.2
Collinsville	52.5	25.4	20.5
Cooktown	48.6	36.1	11.3
Croydon	52.1	21.3	17.0
Dajarra	42.3	40.4	11.5
Dimbulah	53.5	27.4	13.4
Daintree	50.9	43.4	5.7
Georgetown	73.7	18.6	.0
Glenden	71.9	20.7	4.6
Herberton	55.2	23.9	16.3
Hughenden	65.3	26.5	6.7
Injinoo	35.6	58.4	6.0
Julia Creek	71.4	21.0	3.3
Karumba	50.5	35.4	10.9
Kowanyama	39.1	57.8	.8
Lockhart River	32.4	57.6	2.5
Doomadgee	54.5	22.3	17.9
Napranum	41.4	42.4	5.9
Normanton	53.9	32.5	9.7
Pentland	65.2	13.0	21.7
Pormpuraaw	80.3	9.8	9.8
Richmond	68.2	24.5	4.9
Seisia	27.7	57.8	.0
Thursday Island	63.8	22.4	8.2
Umagico	40.0	52.9	7.1
Weipa	77.5	19.9	1.3
Wujal	26.0	71.5	.0

Source: Cdata96, ABS

Table 5. Small and Remote Towns of North Queensland: Total and Indigenous Population

	Total Population	Aboriginal Population	Torres Strait Islanders
Aurukun	778	689	3

Bamaga	756	20	550
Ravenshoe	406	116	0
Burketown	220	82	0
Camooweal	258	119	0
Charters Towers	8893	564	51
Chillagoe	193	52	0
Cloncurry	2459	583	8
Collinsville	2021	36	0
Cooktown	1411	167	0
Croydon	223	88	0
Dajarra	203	168	3
Dimbulah	429	19	6
Daintree	142	9	0
Georgetown	298	9	0
Glenden	1329	24	0
Herberton	994	69	40
Hughenden	1444	141	3
Injinoo	337	82	111
Julia Creek	519	36	0
Karumba	1043	12	0
Kowanyama	912	814	3
Lockhart River	504	448	6
Doomadgee	754	649	0
Napranum	777	541	137
Normanton	1328	640	20
Pentland	200	14	0
Pormpuraaw	84	6	0
Richmond	733	72	8
Seisia	276	133	56
Thursday Island	2483	53	1440
Umagico	231	99	101
Weipa	2200	68	68
Wujal	293	280	0

Source: Cdata96, ABS

Table 6. Small and Remote Towns of North Queensland: Family Type

	Couple With Children	Couple Without Children	One Parent Family	Multi Family,-2 Families	Multi-Family,-3 Families	Lone Person	Group Household
Aurukun	19	18	13	31	18	15	3
Bamaga	52	15	30	14	8	14	9
Ravenshoe	34	35	22	3	0	26	3
Burketown	16	8	9	0	0	16	0
Camooweal	15	6	9	4	0	14	0
Charters Towers	952	620	303	24	3	619	108
Chillagoe	21	14	10	0	0	21	0
Cloncurry	275	140	67	17	0	185	23
Collinsville	249	238	67	3	0	212	12
Cooktown	100	84	40	3	0	141	18
Croydon	15	17	6	3	0	17	0
Dajarra	13	8	12	4	0	5	3
Dimbulah	60	33	19	0	0	48	3
Daintree	9	10	6	0	0	6	0
Georgetown	35	25	6	0	0	22	7
Glenden	239	78	6	9	0	45	6
Herberton	96	67	37	6	0	57	8
Hughenden	164	130	46	10	0	132	19
Injinoo	22	6	6	10	3	10	3
Julia Creek	55	43	10	0	0	54	5
Karumba	53	60	9	0	0	68	8
Kowanyama	41	26	16	34	15	22	3
Lockhart River	25	3	13	18	11	6	0
Doomadgee	42	6	12	24	11	21	3
Napranum	60	21	25	19	5	22	10
Normanton	132	57	49	13	0	48	9
Pentland	17	25	6	3	0	34	3
Pormpuraaw	3	3	0	0	0	4	0
Richmond	93	57	16	0	0	50	7
Seisia	22	0	6	9	0	4	0
Thursday Island	239	81	64	33	7	97	28
Umagico	13	5	8	4	3	0	0
Weipa	343	145	28	6	0	185	19
Wujal	23	3	19	9	0	7	0

Source: Cdata96, ABS

Table 7. Small and Remote Towns of North Queensland: Type of Dwelling and Tenure

	Caravan, Cabin or Houseboat	Improvised Dwelling	House Fully Owned	House Being Purchased	House Rented
Aurukun	0	0	0	0	96
Bamaga	0	3	0	0	87
Burketown	10	9	9	0	27
Camooweal	20	0	12	0	22
Charters Towers	75	0	1198	531	791
Chillagoe	13	0	25	0	27
Cloncurry	107	13	219	78	384
Collinsville	3	3	398	60	276
Cooktown	116	18	139	44	153
Croydon	12	0	15	9	30
Dajarra	0	0	6	0	37
Dimbulah	9	0	84	14	54
Daintree	33	0	10	3	9
Georgetown	35	0	35	11	32
Glenden	10	0	6	0	333
Herberton	3	0	123	49	85
Hughenden	41	3	210	63	186
Injinoo	0	6	0	0	54
Julia Creek	21	0	59	23	71
Karumba	264	27	77	25	63
Kowanyama	0	0	0	0	153
Lockhart River	0	0	0	0	51
Doomadgee	0	3	0	0	93
Napranum	0	7	0	0	124
Normanton	90	6	69	34	174
Pentland	12	0	46	7	26
Pormpuraaw	15	0	3	0	6
Ravenshoe	7	0	46	11	54
Richmond	19	0	92	37	78
Seisia	0	0	0	0	39
Thursday Island	11	0	66	21	373
Umagico	0	0	0	0	28
Weipa	3	0	18	6	639
Wujal	0	6	0	0	45

Source: Cdata96, ABS

Table 8. Small and Remote Towns of North Queensland: Sector of Employment

	Persons employed agriculture	employed in mining industry	construction industry	retail industry	government admin and defence	health and community services	cultural, recreational personal and other services
Aurukun	0	0	0	3	14	219	3
Bamaga	0	0	3	18	23	174	9
Burketown	3	3	0	12	16	0	6
Camooweal	13	0	6	19	6	14	6
Charters Towers	60	522	159	514	167	378	130
Chillagoe	6	16	0	12	3	0	13
Cloncurry	49	51	121	151	93	56	30
Collinsville	10	168	38	89	10	64	30
Cooktown	23	3	36	82	50	40	44
Croydon	9	0	3	0	0	6	36
Dajarra	0	0	3	9	5	3	0
Dimbulah	26	3	10	24	3	9	6
Doomadgee	3	0	10	10	107	19	4
Daintree	3	0	3	9	0	6	0
Georgetown	6	28	9	9	20	6	0
Glenden	0	416	46	24	8	18	9
Herberton	12	13	3	44	15	33	26
Hughenden	43	0	25	96	79	43	15
Injinoo	0	0	3	0	6	121	0
Julia Creek	13	0	19	52	53	31	6
Karumba	30	16	33	56	21	21	17
Kowanyama	0	0	3	0	319	21	3
Lockhart River	0	0	18	6	3	185	0
Mount Garnet	6	12	0	18	3	9	3
Napranum	3	3	3	0	233	4	3
Normanton	6	0	14	50	49	49	38
Pentland	6	3	6	3	8	0	3
Pormpuraaw	41	0	8	0	8	0	0
Richmond	27	0	18	46	47	25	3
Seisia	0	0	3	0	84	0	0
Thursday Island	33	9	63	108	127	171	44
Umagico	0	0	0	3	0	76	0
Weipa	3	614	69	127	33	76	22
Wujal	0	0	0	3	0	125	0
Total	34	34	34	34	34	34	34

Source: Cdata96, ABS

The remaining tables and maps illustrate the distribution of the elderly, and family type, with high numbers of single parent families and multi family households. Both single parent and multi family households are indicators of housing stress. Type of

dwelling shows high numbers of rented dwellings, a factor that in many of the remote towns is strongly linked to poor levels of maintenance. The categories of caravans, cabins, boats and improvised dwellings are very specific to certain settlements and are particularly vulnerable to cyclones and floods.

Table 8 sector of employment, lists the main sectors in places that have extremely limited choices. The government, and service sectors are often the most dominant with a limited retail sector providing the bulk of most alternative areas of employment. There are few employment opportunities for people, and a heavy reliance on the CDEP scheme in many indigenous communities to provide part time employment that supplements welfare dependency.

When faced with long periods of isolation during floods or storms, most households do not have savings to rely on to stock up against emergencies. The reality for many households in the outback is poverty, or at least no reserves, housing stress, and limited resources. These observations were made by many informants in the places that we visited, mirroring other government reports and media reporting. Such factors make households vulnerable to natural hazards. A selection of socio-economic variables has been presented here to illustrate the level of vulnerability.

On top of this, the lack of basic services and infrastructure adds to the vulnerability and pre-existing social problems. Two particular essential services present almost universal problems during floods and cyclones; water and sewerage. The water supplies become contaminated or are destroyed by erosion, and septic tanks and cess pits cease to function. During the immediate post flood period as water recedes or is evaporated insects multiply, in some cases spreading disease, and a major public health disaster develops. This can frequently happen even when a community or region has not been disaster declared. In other words there are often young populations, with many small children, living in housing stress, with little income and no reserves, in some instances running out of food, drinking contaminated water and surrounded by flood waters that contain raw sewage fed upon by millions of flies and mosquitoes. All of this develops in communities with the most basic health services, severely constrained councils and works departments, and very limited contact with the outside world.

Appendix B presents an inventory of services and facilities of every kind in a selection of 11 of the North Queensland small towns. These were compiled from local directories, council information and fieldwork. Not all facilities are actually in the places listed, but may sometimes be shared with other communities. Although the inventory at first appears extensive, the 11 places are all open towns (indigenous communities are much more poorly served by private enterprise services), most places have an extremely limited array of basic services. Table 9 and figure 12 below illustrate a fundamental relationship well researched in geography. There is a very high positive correlation between the number of services and the population size. The smaller the place the more constrained it is in what it can do, and therefore the more vulnerable it is as a community.

Table 9. Small and Remote Towns of North Queensland: Correlations of Population and Services & Infrastructure

		Population	**All Services &**

			Functions
Pearson Correlation	Population	1.000	.977
Sig. (2-tailed)		.	.000
Number		11	11
Pearson Correlation	All Services & Functions	.977	1.000
Sig. (2-tailed)		.000	.
Number		11	11
** Correlation is significant at the 0.01 level (2-tailed).			

Source: Fieldwork, MacGregor

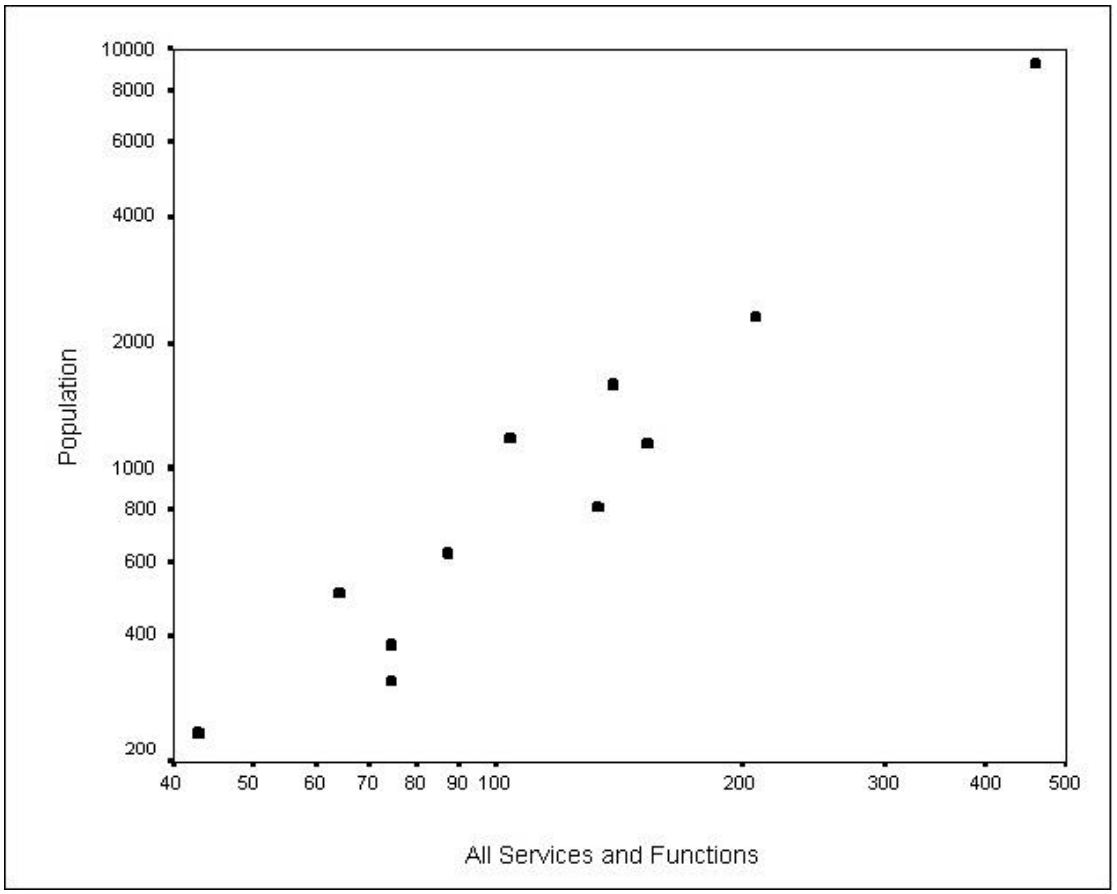

Figure 12. Relationship between Population and All Services and Functions for Eleven Selected Remote Towns of North Queensland

Conclusion

An extensive awareness and preparedness campaign is not the priority in the small and remote centres of the north. They are severely disadvantaged in terms of socio-economic status, and the provision of services and infrastructure. The region desperately needs economic investment, development and subsidisation to raise the generally low standard of living in many of the smallest places (predominantly mining towns would be the one exception to the general pattern of disadvantage). This is obviously not really the concern of Emergency Services. It is a major political issue and comes down to the extent to which government, and the nation, is willing to subsidise the bush. However, what is of concern to emergency managers is the severe constraint that is placed on mitigation for these small and cash strapped places. A different set of rules or expectations must be applied to the small centre in the outback. They will continue to need higher per capita support for disaster reconstruction because their infrastructure is so basic. They also need far greater support in dealing with the allied public health problems that follow a natural hazard.

At the very least these findings will be written up as a journal article that relates disaster vulnerability issues to the broader research and literature on rural disadvantage. The other part of this study has been the initiation of the research into the experiences and stories of indigenous people in dealing with natural hazards. In the medium term this ongoing study will generate a body of unique knowledge that will be of direct benefit to emergency managers, and may hopefully provide a focus for community members in mitigating against the severity of future disasters.

References

Berry, L. 1998. **Gulf River Floods**. Report prepared for Emergency Management Australia and Queensland Emergency Services Division. Centre for Disaster Studies, James Cook University.

David, S.D., Baish, S., and Morrow, B.H. Uncovering the Hidden costs of Coastal Hazards. *Environment*. 41:10-17

Enarson, E., and Scanlon, J. 1999. Gender Patterns in Flood Evacuation: A Case Study in Canada' s Red River Valley. Applied Behavioural Science Review. 7:103-118

Friedman, E. 2000. Coping with Calamity: how well does health care disaster planning work? *JAMA* 272:1875-1880.

Goudie, D. & King, D. 1997. **Breaking Through the Disbelief – the March 1997 Cloncurry Flood**. Report prepared for Emergency Management Australia and Queensland Emergency Services Division. Centre for Disaster Studies, James Cook University.

Granger, K., Jones, T. & Scott, G. Editors. 1999. **Community Risk in Cairns: a multi-hazard risk assessment**. Cities Project, AGSO, Canberra.

Handmer, J. Book Review. *The Geographical Journal*, 165:331

Hewitt, K. 1997. Regions of Risk: A Geographical Introduction to Disasters. Harlow, Addison Wesley Longman.

Kerry, M., Kelk, G., Etkin, D., Burton, I., and Kalhok, S. 1999. Glazed Over: Canada copes with the ice storm of 1998. *Environment*. 41:6-14.

King, D. 1994. Land Use Program: Population. **CYPLUS**: A Joint Initiative Of The Queensland And Commonwealth Governments. Centre For Applied Economic Research And Analysis, James Cook University Of North Queensland

Mitchell, J.K. Natural Hazards: Explanation and Integration. (Review) *Economic Geography*. 75:102-103

Whitney, D.J. and Lindell, M.K. Member Commitment and Participation in Local Emergency Planning Commitees. *Policy Studies Journal* 28:467-845

APPENDICES

Appendix A. Database of Socio-Economic Indicators of Small and Remote Towns of North Queensland

Appendix A Table of Codes Used in Census Socio-Economic Database

CODE	HEADING	ABBREVIATION
001	Town Name	
153	CD/UCL Code	
003	Total Males	B01_Total_Male
004	Total Females	B01_Total_Female
005	Total Persons	B01_Total_Person
006	Unemployed Males	B01_Unemployed_M
007	Unemployed Females	B01_Unemployed_F
008	Unemployed Persons	B01_Unemployed_P
009	Aboriginal Males	B01_Aboriginal_Male
010	Aboriginal Females	B01_Aboriginal_Female
011	Aboriginal Persons	B01_Aboriginal_Person
012	Torres Strait Islander Males	B01_Torres_Str_Islander_Male
013	Torres Strait Islander Females	B01_Torres_Str_Islander_Female
014	Torres Strait Islander Persons	B01_Torres_Str_Islander_Person
015	Persons aged 0 - 4	B03_Aged_0_4_years_P
016	Persons aged 5 - 9	B03_Aged_5_9_years_P
017	Persons aged 10 - 14	B03_Aged_10_14_years_P
018	Persons aged 15 - 19	B03_Aged_15_19_years_P
019	Persons aged 20 - 24	B03_Aged_20_24_years_P
020	Persons aged 25 - 29	B03_Aged_25_29_years_P
021	Persons aged 30 -34	B03_Aged_30_34_years_P
022	Persons aged 35 - 39	B03_Aged_35_39_years_P
023	Persons aged 40 - 44	B03_Aged_40_44_years_P
024	Persons aged 45 - 49	B03_Aged_45_49_years_P
025	Persons aged 50 - 54	B03_Aged_50_54_years_P
026	Persons aged 55 - 59	B03_Aged_55_59_years_P
027	Persons aged 60 - 64	B03_Aged_60_64_years_P
028	Persons aged 65 +	B03_Aged_65_69 + 70_74 + 75_79 + 80_84 + 85_89 + 90_94 + 95_98 + 99+_years_P
029	Total Persons in age by sex table	B03_Total_P
031	Pre school persons	B11_Pre_School_P
032	Persons attending infant or primary school	B11_Infants_Prim_Total_P
033	Persons attending secondary school	B11_Second_Total_P
034	Persons attending TAFE college	B11_Tafe_Total_P
035	Total Persons from 'type of educational institution attending' table	B11_Total_P
036	Males,- left school aged under 15 years	B12_Under_15_years_M
037	Females,- left school aged under 15 years	B12_Under_15_Years_F
038	Persons,- left school aged under 15 years	B12_Under_15_Years_P
039	Males,- never attended school	B12_Never_Attended_Schl_M
040	Females,- never attended school	B12_Never_Attended_Schl_F
041	Persons,- never attended school	B12_Never_Attended_Schl_P
154	Males with qualification,- Higher degree/ Postgraduate diploma/ Batchelor degree /Undergraduate	B17_male_total_higher_d + male_ total_p_g_dip + male_total_bach_d + male_total_und_grad

155	Females with qualification,- Higher degree/ Postgraduate diploma/ Batchelor degree /Undergraduate	B17_female_total_higher_d + female_ total_p_g_dip + female_total_bach_d + female_total_und_grad
156	Persons with qualification,- Higher degree/ Postgraduate diploma/ Batchelor degree /Undergraduate	B17_persons_total_higher_d + persons_total_p_g_dip + persons_total bach_d + persons_total_und_grad
045	Males with skilled or basic vocational qualification	B17_male_total_sklld_voc + male_total_basic_voc
046	Females with skilled or basic vocational qualification	B17_female_total_sklld_voc + female_total_basic_voc
047	Persons with skilled or basic vocational qualification	B17_persons_total_sklld_voc + persons_total_basic_voc
051	Males aged 15 - 19 employed full time	B18_males_15_19_yrs_emp_ft
052	Males aged 15 - 19 employed part time	B18_males_15_19_yrs_emp_pt
053	Males aged 15 - 19 unemployed	B18_males_15_19_yrs_unemp_tot
054	Males aged 15 - 19,- total labour force	B18_males_15_19_yrs_lab_frce
055	Females aged 15 - 19 employed full time	B18_females_15_19_yrs_emp_ft
056	Females aged 15 - 19 employed part time	B18_females_15_19_yrs_emp_pt
057	Females aged 15 - 19 unemployed	B18_females_15_19_yrs_unemp_tot
058	Females aged 15 - 19,- total labour force	B18_females_15_19_yrs_lab_frce
059	Persons aged 15 - 19 employed full time	B18_persons_15_19_yrs_emp_ft
060	Persons aged 15 - 19 employed part time	B18_persons_15_19_yrs_emp_pt
061	Persons aged 15 - 19 unemployed	B18_persons_15_19_yrs_unemp_tot
062	Persons aged 15 - 19,- total labour force	B18_persons_15_19_yrs_lab_frce
063	Males aged 20 - 24 employed full time	B18_males_20_24_yrs_emp_ft
064	Males aged 20 - 24 employed part time	B18_males_20_24_yrs_emp_pt
065	Males aged 20 - 24 unemployed	B18_males_20_24_yrs_unemp_tot
066	Males aged 20 - 24,- total labour force	B18_males_20_24_yrs_lab_frce
067	Females aged 20 - 24 employed full time	B18_females_20_24_yrs_emp_ft
068	Females aged 20 -24 employed part time	B18_females_20_24_yrs_emp_pt
069	Females aged 20 - 24 unemployed	B18_females_20_24_yrs_umemp_tot
070	Females aged 20 - 24,- total labour force	B18_females_20_24_yrs_lab_frce
071	Persons aged 20 - 24 employed full time	B18_persons_20_24_yrs_emp_ft
072	Persons aged 20 -24 employed part time	B18_persons_20_24_yrs_emp_pt
073	Persons aged 20 -24 unemployed	B18_persons_20_24_yrs_unemp_tot
074	Persons aged 20 - 24,- total labour force	B18_persons_20_24_yrs_lab_frce
075	Males aged 25 - 34 employed full time	B18_males_25_34_yrs_emp_ft
076	Males aged 25 - 34 employed part time	B18_males_25_34_yrs_emp_pt
077	Males aged 25 - 34 unemployed	B18_males_25_34_yrs_unemp_tot
078	Males aged 25 - 34 total labour force	B18_males_25_34_yrs_lab_frce
079	Females aged 25 - 34 employed full time	B18_females_25_34_yrs_emp_ft
080	Females aged 25 - 34 employed part time	B18_females_25_34_yrs_emp_pt
081	Females aged 25 - 34 unemployed	B18_females_25_34_yrs_unemp_tot
082	Females aged 25 - 34,- total labour force	B18_females_25_34_yrs_lab_frce
083	Persons aged 25 - 34 employed full time	B18_persons_25_34_yrs_emp_ft
084	Persons aged 25 - 34 employed part time	B18_persons_25_34_yrs_emp_pt
085	Persons aged 25 - 34 unemployed	B18_persons_25_34_yrs_unemp_tot
086	Persons aged 25 - 34,- total labour force	B18_persons_25_34_yrs_lab_frce
087	Total males employed full time	B18_male_total_emp_ft
088	Total males employed part time	B18_male_total_emp_pt
089	Total males unemployed	B18_male_total_unemp_tot
090	Total males,- total labour force	B18_male_total_lab_frce

091	Total females employed full time	B18_female_total_emp_ft
092	Total females employed part time	B18_female_total_emp_pt
093	Total females unemployed	B18_female_total_unemp_tot
094	Total females,- total labour force	B18_female_total_lab_frce
095	Total persons employed full time	B18_persons_total_emp_ft
096	Total persons employed part time	B18_persons_total_emp_pt
097	Total persons unemployed	B18_persons_total_unemp_tot
098	Total persons,- total labour force	B18_persons_total_lab_frce
099	Total persons in age by labour force by sex table	B18_persons_total_total
100	Males employed in agricultural industry	B19_total_ag_frst_fshng_male
101	Females employed in agricultural industry	B19_total_ag_frst_fshng_female
102	Persons employed in agricultural industry	B19_total_ag_frst_fshng_persons
103	Males employed in mining industry	B19_total_mining_male
104	Females employed in mining industry	B19_total_mining_female
105	Persons employed in mining industry	B19_total_mining_persons
106	Males employed in construction industry	B19_total_cnstrction_male
107	Females employed in construction industry	B19_total_cnstrction_female
108	Persons employed in construction industry	B19_total_cnstrction_persons
109	Males employed in the retail industry	B19_total_whlsle_trde_male + total_ retail_trde_male
110	Females employed in the retail industry	B19_total_whlsle_trde_female + total_retail_trde_female
111	Persons employed in the retail industry	B19_total_whlsle_trde_persons + total_retail_trde_persons
157	Males employed in government admin and defence	B19_total_gvnmt_admn_def_male
158	Females employed in government admin and defence	B19_total_gvnmt_admn_def_female
159	Persons employed in government admin and defence	B19_total_gvnmt_admn_def_persons
160	Males employed in health and community services	B19_total_hlth_com_serv_male
161	Females employed in health and community services	B19_total_hlth_com_serv_female
162	Persons employed in health and community services	B19_total_hlth_com_serv_persons
163	Males employed in cultural, recreational, personal and other services	B19_total_cltrl_rec_serv_male + total_prsnl_oth_serv_male
164	Females employed in cultural, recreational, personal and other services	B19_total_cltrl_rec_serv_female + total_prsnl_oth_serv_female
165	Persons employed in cultural, recreational, personal and other services	B19_total_cltrl_rec_serv_persons + total_prsnl_oth_serv_persons
166	Males with occupation,- managers, administrators, professionals or associate professionals	B20_total_mangrs_admnstrtrs_male + total_profssnls_male + total_assoc_profs_male
167	Females with occupation,- managers, administrators, professionals or associate professionals	B20_total_mangrs_admnstrtrs_ female + total_profssnls_female + total_assoc_profs_female
168	Persons with occupation,- managers, administrators, professionals or associate professionals	B20_total_mangrs_admnstrtrs _persons + total_profssnls_persons + total_assoc_profs_persons
169	Males with occupation,- tradesperson or	B20_total_trdsprsns_rltd_wrkrs_m

	related workers	
170	Females with occupation,- tradesperson or related workers	B20_total_trdsprsns_rltd_wrkrs_f
171	Persons with occupation,- tradesperson or related workers	B20_total_trdsprsns_rltd_wrkrs_p
172	Males with occupation,- clerk / service worker	B20_total_advncd_clrcl_serv_wrkr_m + total_int_clercl_wrkrs_m + total_elmtry_clrcl_wrkrs_m
173	Females with occupation,- clerk / service worker	B20_total_advncd_clrcl_serv_wrkr_f + total_int_clercl_wrkrs_f + total_elmtry_clrcl_wrkrs_m
174	Persons with occupation,- clerk / service worker	B20_total_advncd_clrcl_serv_wrkr_p + total_int_clercl_wrkrs_p + total_elmtry_clrcl_wrkrs_p
175	Males with occupation,- intermediate production / transport worker	B20_total_int_prod_trnprt_wrkrs_m
176	Females with occupation,- intermediate production / transport worker	B20_total_int_prod_trnprt_wrkrs_f
177	Persons with occupation,- intermediate production / transport worker	B20_total_int_prod_trnprt_wrkrs_p
133	Males with occupation,- labourers and related workers	B20_total_lbrers_rltd_wrkrs_male
134	Females with occupation,- labourers and related workers	B20_total_lbrers_rltd_wrkrs_female
135	Persons with occupation,- labourers and related workers	B20_total_lbrers_rltd_wrkrs_persons
140	Household type,- couple with children	B26_fh_of_cfwc_total
141	Household type,- couple without children	B26_fh_of_cfwoc_total
142	Household type,- one parent family	B26_fh_of_opf_total
143	Household type,- multi family,- 2 families	B26_fh_two_fams_total
144	Household type,- multi-family,- 3 families	B26_fh_three_fams_total
145	Household type,- lone person	B26_nfh_lne_prsn_hhold_total
146	Household type,- group household	B26_nfh_grp_hhold_total
178	Dwelling,- caravan / cabin / houseboat	B27_od_cvan_cbn_hsebt_total
149	Dwelling,- improvised dwelling / tent	B27_od_imp_hme_tnt_total
150	House fully owned	B25_total_owned
151	House being purchased	B25_ total_bng_prchsd
152	House rented	B25_total_rntd_tot

Appendix B. Database of Services and Facilities of a Selection of Small and Remote Towns in North Queensland

APPENDIX B. Table of Codes Used in Service and Infrastructure Database

Indicators	Data Type	Data Source
Socio-demographic/economic		
1) Total population (1986) (pop_1986) 2) Total population (1991) (pop_1991) 3) Rate of growth/decline (growth)	Total number of people. Increase/decrease as % of 1986 population.	
4) Indigenous Australian population (indig_pop)	Expressed as a % of total population.	Australian Bureau of Statistics (ABS). All employment data derived from the 1991 census using Cdata91.
5) Employment in agriculture (e_agric) 6) Employment in mining & associated industries (e_mine) 7) Employment in manufacturing (e_manufg) 8) Employment in electricity, gas & water (e_electy) 9) Employment in construction (e_constr) 10) Employment in wholesale & retail trade (e_trade) 11) Employment in transport & storage (e_trans) 12) Employment in communications (e_commun) 13) Employment in finance, property & business services (e_busins) 14) Employment in public administration & defense (e_admdef)	All employment data is expressed as a % of the total workforce.	
15) Employment in community services (e_comser) 16) Employment in recreation, personal & other services (e_recrtn) 17) Total unemployed (unemploy)	Expressed as a % of total w/force not employed.	
Infrastructure		
18) Standard of water provision (water_pr) 19) Standard of power provision (power_pr) 20) Access to main, sealed arterial roads (a_roads) 21) Access to rail facilities (rail_fac) 22) Standard of airport/airstrip facilities (airport) 23) Standard of port/wharf facilities (port_wha)	All infrastructure is ranked data.	Derived directly from field observations and from comments received from key informants.
Community services		
24) Number of pre-schools (pre_scho) 25) Number of primary schools (prim_sch) 26) Number of high schools (h_school) 27) Number of TAFEs (tafes) 28) Number of medical centres/hospitals (medical) 29) Number of medical specialists (e.g. dentists, chiropractors etc) (dent_ch) 30) Number of libraries (library) 31) Number of Aboriginal	Count of each service.	Derived directly from field

organisations/associations (abor_org) 32) Number of community organisations/associations (comm_org) 33) Number of community facilities (e.g. community halls etc) (comm_fac) 34) Number of places of worship (churches) 35) Number of sports facilities (sport) 36) Number of sporting clubs (s_clubs) 37) Number of community clubs (e.g. Lions, CWA etc) (c_clubs) 38) Number of sale yards (sale_yds)		observations and indirectly from community directories and other published material.
Government services 39) Number of local government administration (l_g_admin) 40) Number of local government works depots (l_g_works) 41) Number of state/territory government administration (s_g_admin) 42) Number of federal government administration (f_g_admin) 43) Number of post offices (p_office) 44) Number of defense force facilities (barracks)	Count of each service.	Derived directly from field observations and indirectly from community directories and other published material.
Industry & wholesale services 45) Number of fuel depots (fuel_dep) 46) Number of agricultural suppliers (agr_supls) 47) Number of warehouses (warehous) 48) Number of general wholesale product suppliers (wholesale) 49) Number of abattoirs (abattoir) 50) Number of Building companies (bldg_con) 51) Number of transport carriers (carriers) 52) Number of electrical contractors (electric) 53) Number of joiners/carpenters (joiners) 54) Number of plumbers (plumbers) 55) Number of mechanical engineering companies (engineer) 56) Number of plant hire companies (road_pla) 57) Number of civil engineering companies (includes surveyors) (civil_mi) 58) Extent of agricultural (horticultural) activity (horticul) 59) Extent of mining activity (mines) 60) Level of dependency on pastoral activity (pastoral)	Count of each service. Count of crop varieties. The number of mines. Ranked data.	Derived directly from field observations and indirectly from community directories and other published material. Field and literature. Literature. Literature and from comments received from key informants.
Retail services 61) Number of hotels/motels (m_hotels) 62) Number of caravan (camping) parks		

(c_parks) 63) Number of guest houses (includes farm-stays, B & Bs etc) (g_houses) 64) Number of tourist facilities (e.g. tourist information) (t_facil) 65) Number of tour operators (tour_opp) 66) Number of charter services (e.g. aircraft, boat) (charters) 67) Number of entertainment facilities (e.g. cinemas, theatres) (entrtnmt) 68) Number of banks (banks) 69) Number of financial services (e.g. accountants) (financ_s) 70) Number of public houses (pubs) 71) Number of motor vehicle repair shops (vehicle_r) 72) Number of cleaning services (cleaning) 73) Number of beauty services (e.g. hairdressers) (beauty_s) 74) Number of legal services (e.g. lawyers) (legal_s)	Count of each service.	Derived directly from field observations and indirectly from community directories and other published material.
Retail stores 75) Number of cafes/restaurants (cafes) 76) Number of tourist shops (e.g. souvenirs) (t_shops) 77) Number of travel agents (travel_a) 78) Number of arts and crafts (art_crft) 79) Number of service stations (retail fuel) (servos) 80) Number of supermarkets (s_market) 81) Number of grocery stores (food_sto) 82) Number of general stores (g_stores) 83) Number of garden centres (garden_c) 84) Number of newsagents (n_agents) 85) Number of hardware stores (h_ware) 86) Number of chemists (chemists) 87) Number of clothing stores (clothing) 88) Number of fruit and vegetable stores (fruit_ve) 89) Number of furniture stores (furniture) 90) Number of electrical appliance (white goods) stores (elec_app) 91) Number of vehicle dealers (cars, boats etc) (veh_sale) 92) Number of real estate agents (real_est) 93) Number of butchers (butchers) 94) Number of bakers (bakers) 95) Number of fish mongers (fish_mon)	Count of each outlet.	Derived directly from field observations and indirectly from community directories and other published material.
Economic potential 96) Tourism growth potential (t_grth_p) 97) Pastoralism growth potential (p_grth_p) 98) Agricultural growth potential (a_grth_p) 100) Mining growth potential (m_grth_p)	All economic growth potential is ranked data.	Derived from comments received from key informants.
Environmental & Cultural		

101) Size of hinterland 102) Hinterland population	Area (km²) Estimated from ABS SLAs	Determined from maps
101) Number of landscape features (scenic_b)	Count of notable features.	ABS data
102) Extent of wildlife features (fauna_at) 103) Extent of historic/cultural features (cultural)	Count of notable features	Derived from various published materials.

Complete List of Indicators Used to Characterise Eleven Savanna Towns