Working towards sustainability in small towns: perspectives from northern Australia

Colin J. Macgregor

School of Geography and Geosciences,
University of St Andrews,
St Andrews, Fife KY16 9AL, Scotland
Fax: +44 (0) 1334 463949 E-mail: cjm27@st-andrews.ac.uk

Abstract: *Local Agenda 21* emphasises the role of local governments in initiating sustainability strategies. However, there is considerable debate about what constitutes a sustainable community and about how to progress towards it. Local sustainability initiatives also require wide support from the community but for what sorts of sustainability initiatives can we expect to find support? The towns of northern Australia provided a useful geography to examine these questions. The emerging global economic playing field has offered economic opportunities as never before to some towns in the region whilst others have experienced rapid decline. In short, different sustainability issues have emerged depending upon regional circumstances. An analytical model capable of assessing community support for local sustainability initiatives is presented. The model was used to compare and contrast a sample of towns from northern Australia and it was found that there was good support for many strategic initiatives that would encourage sustainability.

Keywords: local sustainability initiatives; community needs; community support; analytical model.

Reference to this paper should be made as follows: Macgregor, C.J. (2003) 'Working towards sustainability in small towns: perspectives from northern Australia', *Int. J. Environment and Sustainable Development*, Vol. 2, No. 4, pp.342–363.

Biographical notes: Colin Macgregor is a Post-doctoral Research Fellow attached to the School of Geography and Geosciences at the University of St Andrews in Scotland. His research interests surround the use of social science methodologies in delivering sustainable outcomes – particularly at local and community levels and in natural resource management contexts. Dr Macgregor's PhD examined support and impediments to achieving community sustainability within small town communities of northern Australia. Before joining the University of St Andrews in May 2001 he was a research scientist with the Bureau of Rural Sciences in Australia. He has also lectured for nearly ten years in geography and environmental studies at various Australian universities including James Cook University in Townsville, Queensland.

Copyright © 2003 Inderscience Enterprises Ltd.

1 Introduction

The concept of 'sustainability' now seems so entrenched in the government policies of OECD countries that it seems appropriate to describe it as a 'social norm' [1]. If this is true then the principles that underlie sustainability should guide the information dissemination, strategic thinking and planning, behaviour, and the actions, of all organisations, groups and even individuals in society.

So far sustainability has found its way through to the more obvious applications in the environmental management context and it has been widely adopted as an underlying premise in most recent natural resource management and planning documents. It should also have an equally important role in guiding social and economic management and planning. However, there is increasing concern that, in many circumstances, the exact meaning of sustainability has been obscured as it is perverted by various socio-political actors seeking to use it to promote their own agendas [2]. Of even more concern perhaps, is that since sustainability was first defined as a social goal more than 15 years ago, our capacity to assess and monitor progress towards it still seems illusive particularly in the social and economic realms at the local level [3]. This paper reviews the highlights of a study that sought to address this concern. Specifically, the research used community perceptions and attitudes to examine community support for sustainability in a sample of country towns in regional and remote northern Australia.

2 Broad definitions of sustainability

The original concept of sustainable development can be traced back to the 1987 report *Our Common Future* which was produced by the United Nations' World Commission on Environment and Development. Sustainable development, it was asserted, was "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [4]. This simple definition has far-reaching implications, the first and not least of which is associated with the environment. In considering this, the Australian Biological Diversity Advisory Committee [5] through its *National Strategy for the Conservation of Australia's Biological Diversity* emphasised the importance of maintaining biological diversity:

> "Biological diversity underpins human well being through provision of ecological services, such as the maintenance of soil fertility and the supply of clean, fresh water. It also provides recreational opportunities and acts as a source of inspiration and cultural identity".

It is also implied by the WCED definition of sustainability that inter-generational equity is one of the fundamental goals of sustainability but the concept of equity has implications for existing generations also i.e. intra-generational equity. Falk *et al.* [6] perhaps best summarised this when they said:

> "Equity derives from a concept of social justice. It represents a belief that there are some things which people should have, that they are basic needs that should be fulfilled, that burdens and rewards should not be spread too divergently across the community, and that policy should be directed with impartiality, fairness and justice towards these ends."

There is widespread consensus that sustainability must be accountable in environmental, social and economic contexts [7]. The nature of sustainability requires that initiatives must be both 'top-down' and 'bottom-up' i.e. it relies on both a well-informed sensitive leadership on the one hand and community-wide support on the other.

Agenda 21 was born at the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in 1992. The document can be described as a blueprint for sustainable development and Chapter 7 in particular emphasises the important role that local government has in bringing about sustainability. The extent to which the local initiatives of Agenda 21 are being promoted and adopted is an important question in itself. However, since sustainability is heavily dependent on community support it also seems pertinent to question how receptive and supportive communities are to local sustainability initiatives and strategies. It is this second question that formed the basis of the research behind this paper.

3 Developing the analytical model for assessing support for local sustainability initiatives

Measuring the condition or health of the environment is usually a fairly straightforward scientific process. If one is concerned with water quality, for example, then samples can be taken and laboratory chemical analysis will reveal its condition. It is also fairly easy to monitor changes over time with such indicators to determine if improvements are being made. Many of the indicators within State of the Environment (SoE) reporting are of this nature and in most cases their selection can take place with little regard to theoretical considerations. Whilst this approach may be quite acceptable in SoE reporting, if one is interested in the less tangible aspects of sustainability, such as the level of support for community sustainability, then the selection of indicators becomes more difficult. This is because there is such a wide variety of potential indicators that could be drawn on and there is the temptation to select a vast range in order to ensure sufficient coverage. The application of a well conceived theory or theories can assist the research process and ensure indicator selection is not carried out in an ad hoc manner, i.e. indicators are selected because they are known to contribute to a construct of interest, which in this case is sustainability support.

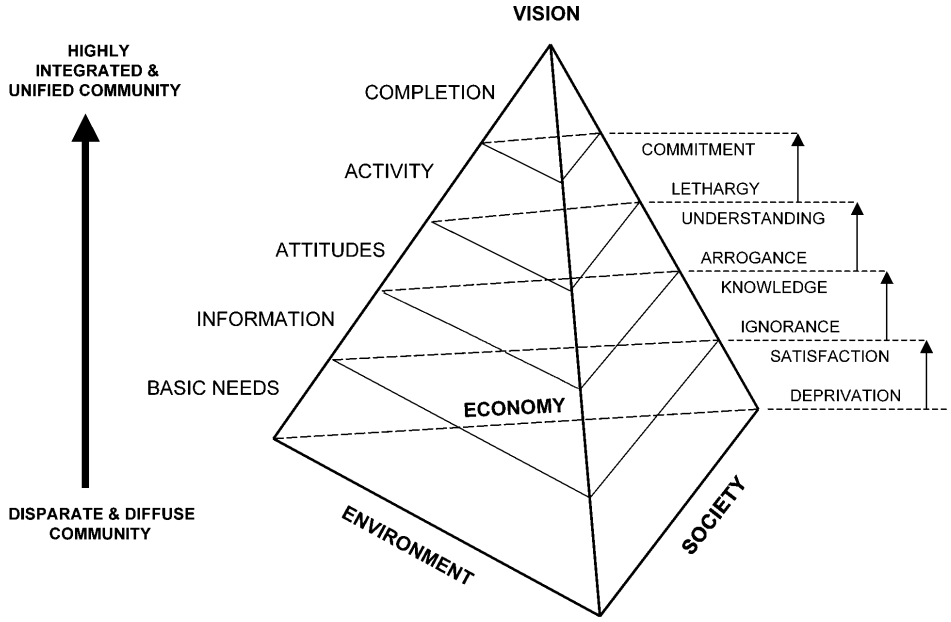
The theoretical model described in Figure 1 was conceived by taking account of relevant works from a range of academic disciplines and perspectives. These include the work of the behavioural psychologist Abraham Maslow [8], Sherry Arnstein's [9] work on community involvement, the *New Environmental Paradigm* (NEP) scale developed by Dunlap and Van Liere [10], Andrew Nash's [11] work on environmental ethics, the *Ecosystem Health* concept developed by writers such as Robert Costanza *et al*. [12] and David Rapport [13], futurist work of Duane Elgin [14] and Richard Slaughter [15] and lastly the work of sustainability commentators such as Gale and Cordray [16], Mary Clark [17], and Bill Berkowitz [18].

It is useful to regard the model as three-dimensional – one dimension each for environment, society and economy. The pyramid image aims to convey the impression of two extremes a community could find itself in with respect to sustainability. A community that can be regarded as 'unsustainable' would be located at the bottom of the pyramid and characteristically would be disparate and diffuse. On the other hand, a community that could be described as 'sustainable' would probably be highly united

and integrated in the purpose of achieving sustainability. For the purpose of description, there are five stages or levels in progressing towards sustainability, which are (from bottom to top), *basic needs, information, attitudes, activity* and *completion*.

It is reasonable to assume that the level of support within each of the levels will vary and it is this variation that lends itself to indicator development. For example, in terms of the provision of *basic needs* (essentially: food, water, shelter, safety etc.) the community could either be in a position of complete supply ('satisfaction') or completely starved ('deprivation'). The indicators within this level are more likely to refer to structural circumstances that are likely to encourage or prevent potential support and many of these could be developed from simple observation e.g. the provision of suitable housing, adequate healthcare and so on. However, these can also be inferred from residents' comments concerning such basic services.

Figure 1 Hierarchical model for assessing and describing sustainability support in small town communities



The *information* level essentially refers to knowledge – knowledge about sustainability and the types of initiatives that are likely to encourage it. It can refer to community knowledge but probably more important is its reference to the kind of knowledge that has been diffused to local government, since it is they that have the primary role in developing local sustainability initiatives. It follows then, that in terms of *information*, those in local government could possibly have full 'knowledge' or alternatively be in complete 'ignorance'.

Community *attitudes* towards the principles of sustainability could, on the one hand, reflect a position of 'arrogance', typified by an attitude that can be summarised by the hypothetical quote, '…sustainability has nothing to do with me – I've got to get on with my life and make the most of it in any way I can'. The other extreme ('understanding') can be exemplified by the statement, '… it's very important that we all pull together

to improve all our lifestyles so long as we don't do it at the expense of future generations'.

The *activity* level can be differentiated by the degree to which the community is actually working towards achieving sustainability. Aspects of this would include community volunteering, membership of support organisations and the like. The dimensional nature of this can loosely be described as 'lethargy' at the bottom or 'commitment' at the top.

It is important to acknowledge that unlike Maslow's [8] hierarchy of human needs, it is not absolutely essential for a community to obtain complete 'satisfaction' on the *basic needs* level before the next level, or even higher levels, can be addressed. It seems plausible, for example, that a community could score well on the *attitudes* level but poorly on the *basic needs* dimension.

The development of indicators should take account of local contexts, however, it should to be noted that identification and selection of indicators within all the levels and dimensions must be based on scales so that scores can be calculated and the community 'plotted' against the model. From this, a pattern of where the community sits within the model will emerge, making it possible to identify areas of concern and so informing strategic processes.

4 Research methods used to examine regional sustainability support

In order to identify a suitable set of case study towns from northern Australia it was necessary to develop a profile of the towns in the region. Combinations of both qualitative and quantitative indicators were used to describe an original sample of 19 towns. The data described population size, demographic characteristics, predominant economic functions, service provision and the geographic context of their position in the region. In order to ensure the final sample was representative, a hierarchical statistical clustering procedure was used to identify their inherent groupings and ultimately the individual case study towns. A total of six towns were identified to represent five groups:

- Hughenden and Cloncurry represented towns that can be described as pastoral in nature.
- Charters Towers represented the larger towns of the region.
- Jabiru, which was originally a mining town, represented those with dominant tourist functions.
- Halls Creek is typical of towns dominated by indigenous populations.
- Kununurra represented economically vibrant towns.

An extensive review of literature associated with central principles of sustainability was undertaken. However, to ensure context validity, these principles were explored and ultimately placed within a northern Australia context following a series of interviews that were held with prominent local government staff members from all 19 towns. As a result, encouraging sustainability in the small towns of northern Australia can be summarised by the following environmental, social and economic principles:

- at the most fundamental level, efforts should be made to prevent further environmental damage [19,20]
- initiatives should be undertaken that seek to prevent/repair any landscape or environmental damage e.g. those associated with landcare and/or Integrated Catchment Management [21,22]
- mixed land use and higher density residential planning should be encouraged (particularly in the larger towns) [23,24]
- the cultural landscape should be protected e.g. heritage buildings [23,25]
- construction of energy efficient housing should be encouraged wherever possible [26,27]
- recycling should be both possible and promoted wherever possible [24,28]
- there should be good access to a wide range of local services (e.g. government, retail, education, health recreation etc.) [29,30]
- there should be a low incidence of alcohol abuse and related problems (particularly relevant to towns dominated by indigenous populations) [31,32]
- there should be high levels of perceived personal safety [33,34]
- activities and service provision that are likely to foster social capital should be encouraged [35,36]
- there should be local government and community mechanisms in place to empower individuals and encourage a high level of community involvement in planning and management decision making [37,38]
- diversity in economic activity should be encouraged, especially that which is small-scale, low technology and of a value-adding nature [39,40]
- emphasis should be placed on locally initiated economic development [41,42]
- where there is sufficient community support and expertise, institutional arrangements that are community centred (e.g. community banking, LETS schemes, Cooperatives etc.) should be encouraged [43,44]
- encourage an ethos within the community of 'buy locally whenever possible' [45,46].

These principles provided the basis for the development of a community questionnaire containing a total of 46 attitude items. These questionnaires were distributed to 200 residents of each of the six small towns listed above, except Halls Creek where 100 were distributed [47]. Distribution and collection of questionnaires was done by hand to ensure high return rates (Table 1).

Table 1 Summary of returned community questionnaires across the six towns

				Questionnaires returned					
				Total		*Non-indigenous (stated)*		*Indigenous (stated)*	
Town	*Total population**	*Indigenous population (% of total)**	*N*	*Total returned*	*Return rate (%)*	*Count*	*% of total*	*Count*	*% of total*
C. Towers	9231	6	200	146	73	136	93.1	6	4.1
Hughenden	1589	9	200	192	96	170	88.5	12	6.3
Cloncurry	2304	21	200	157	78.5	118	75.2	33	21
Jabiru	1741	4	200	106	53	93	87.7	7	6.6
Kununurra	4062	24	200	167	83.5	139	83.2	14	8.4
Halls Creek	1302	61	100	80	80	58	72.5	22	27.5

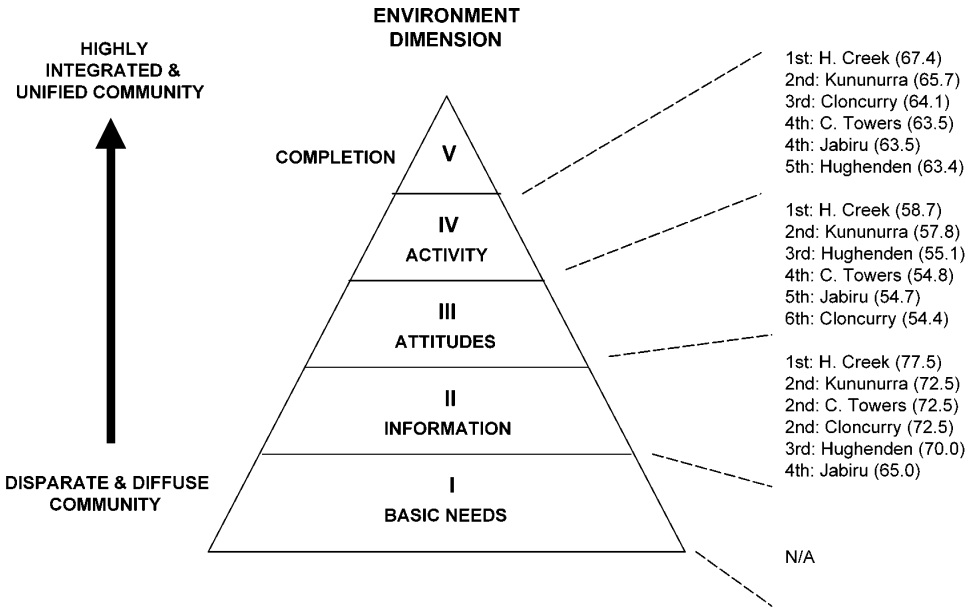
**Source*: Australian Bureau of Statistics.

5 The environment dimension

The major findings for the environment dimension are presented in Figure 2. To aid interpretation, all scores displayed are out of 100 so that a higher score indicates greater support. Only levels II, III and IV have results associated with the environment dimension. This is because key informants of a 'relevance survey' conducted before the 'community survey' believed that none of the environment question items was relevant to communities struggling with *basic needs*. However, the results in some ways appear to contradict what those key informants had assumed. As will be seen later, Halls Creek, the town struggling most with basic social and economic needs, was also the one town to score the highest on all three levels of the environment dimension. However, this result must also be considered within the context of the sample populations, which in Halls Creek was largely made up of professional, well-educated people who were often employed in some management capacity within the town. Notably, they are well paid and so are certainly not struggling with economic basic needs. The others in the sample were indigenous people who are well known to have a strong affiliation with the 'land' regardless of their position with respect to basic needs.

Compared to the social and economy dimensions, all towns achieved a relatively high score on the environment dimension. What is more, most of the environment question items were statistically reliable (Cronbach's *alpha* = .69), which made it possible to develop an 'environmental empathy scale' similar to Dunlap and Van Liere's *New Environmental Paradigm* (NEP) scale [10]. An examination of this also showed that Halls Creek expressed the greatest environmental empathy but it is important to acknowledge that the difference between the towns on all these measures is only marginal. In fact, the differences between them were only statistically significant between the highest and lowest scoring towns and even there the margin on the scale was just 5%. This suggests people are generally supportive of the environment regardless of social and economic circumstances.

Figure 2 Results found on the environment dimension



Some theorists have asserted that attitudes have an important influence on intentions and behaviour (see for example, [22,48–50]). This implies that if one can encourage environmentally sensitive attitudes, then people's behavior will also become more environmentally sensitive. However, a regression analysis of the environmental data here revealed only a very marginal correlation between higher scores for environmental empathy and environmental activity in the form of environmental group membership (*adjusted R square* = .13). This confirms the findings of other studies that have also used environmental attitude scales (e.g. [10,51]) and the implication is that the link between environmental attitudes and environmental behaviour is tenuous at best.

Since the majority of people in these towns are already empathetic towards the environment then it is quite likely that campaigns that seek to encourage people to behave more empathetically may actually be a waste of resources. This is not to say that the diffusion of information concerning sustainability does not have an important role to play but it seems likely that more could be achieved by addressing other areas of sustainability i.e. social and/or economic concerns.

6 The society dimension

The society dimension (Figure 3) reveals a much more diverse range of results compared with the environment dimension. Firstly, the scores were generally lower than the environment dimension, particularly on the basic needs and information levels, suggesting perhaps that people were less favourable to such sustainability initiatives. Secondly, the differences in the scores of the highest scoring and lowest scoring towns was as much as 15%. This suggests that the towns differed quite markedly in terms of community attitudes towards social sustainability issues. As one might expect it was the

largest town, Charters Towers, that scored highest on three of the four levels whilst Halls Creek (the most remote and ethnically diverse town) came last on all four levels and by quite a significant margin.

Unlike the environment dimension, there is not sufficient internal reliability to construct a single item scale that could be said to be representative of a community-wide view of social sustainability. Given the diversity of the results, such a scale would reveal little about the patterns revealed in Figure 3 anyway. Explanations can only be found by looking at this dimension in more detail. Inevitably there are common themes within the data that statistical procedures can draw upon to determine groupings of variables. Applications of factor analyses revealed seven groups, which for convenience were named cultural sensitivity, service provision, community involvement, indigenous concerns, sense of security, historic sensitivity, and social interaction (Table 2).

Figure 3 Results found on the society dimension

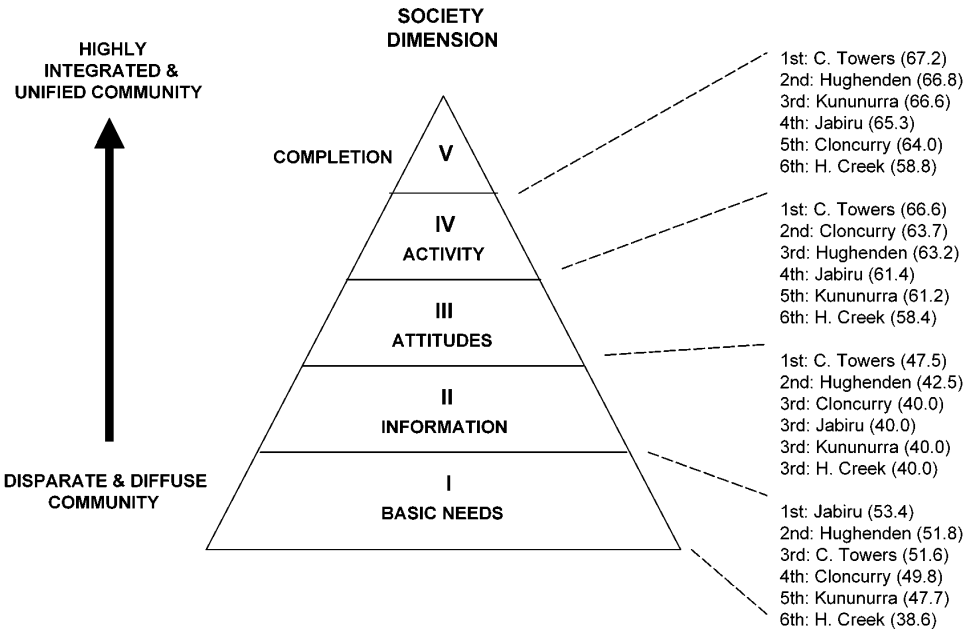


Table 2 Sustainability support scores (%) obtained for the major social dimensional constructs

	Cultural sensitivity	*Service provision*	*Community involvement*	*Indigenous concerns*	*Sense of security*	*Historic sensitivity*	*Social interaction*	*Sense of place*
Charters Towers	52.5	54 4	87.5	57.5	38.7	63.3	58.7	71.1
Hughenden	41.2	48.1	90.5	60	56.2	62.5	61.2	73.9
Cloncurry	52.5	45.6	88.5	48.7	53.7	60	56.2	69.7
Jabiru	52.5	48.1	84.5	55	58.7	50	58.7	64.7
Kununurra	48.7	51.9	84.1	45	31.2	51.7	55	62.2
Halls Creek	60	32.2	83	35	36.2	52.5	50	58.3

An important eighth society construct, sense of place or community, was also developed from variables that are well documented in literature (see for example, [52–54]). So long as there is a reasonable degree of internal reliability within variables associated with the sense of place construct, then it is possible develop a scale for it. In this case nine questionnaire items contributed to the sense of place scale (*alpha* = .53). Table 2 displays the scores for this and the other social sustainability constructs and, as explained above, a higher score indicates greater support.

The scores for sense of place would seem to suggest there is some regional variation i.e. the Queensland towns (Charters Towers, Hughenden and Cloncurry) obtained a higher score than the Western Australian and Northern Territory towns (Kununurra, Halls Creek and Jabiru). This pattern can also be seen with historic sensitivity. These findings support earlier work completed by other human geographers and rural sociologists (e.g. [55,56]) who noted the presence of '*spiralists*' in new and remote rural communities. This group of people tends to comprise young, highly qualified and well-paid employees. This is certainly the demographic pattern that can be observed in the towns of Jabiru, Kununurra and Halls Creek. Such people are often attracted to such towns by the incomes offered and because it often fits in with their early career development. Success in the job means an upward spiral in their careers, which will take them on to larger, less remote places and promotion. In this sense they are the least attached and committed group of people within the communities.

As one might expect, the largest town in the sample, Charters Towers (population ~9,000), obtained the highest score for service provision but whilst the smallest town (Halls Creek) has by far the lowest score here, it is only just the smallest town. In fact, Halls Creek, Jabiru and Hughenden all have very similar populations (~1,500 people). To explain this, one must look to the histories of these towns. Hughenden has a long history and was once a much larger town and although it is now declining, its functions partially reflect its past so that the town remains fairly well serviced. *Prospect theory* [57] maintains that once something is established (such as a service), it is harder to take it away even when demand reduces. On the other hand, Jabiru was relatively recently established as a mining town and the mining company had a vested interest to ensure the provision of high quality services in order to attract and retain skilled employees. Unfortunately Halls Creek has neither heritage nor economic incentives to encourage the provision of such services. Consequently, only the bare necessities are provided. It is also notable that just one owner provides most of the retail services in Halls Creek, so with a virtual monopoly, prices for goods and services are relatively high.

The town to score the highest for cultural sensitivity (Halls Creek) is the town with the greatest indigenous population. Of course cultural sensitivity is an important aspect of sustainability but the town also scored the lowest in terms of indigenous concerns. This could suggest there is an inverse relationship between indigenous concerns and indigenous sensitivity i.e. the greater the extent of indigenous concerns, the more sensitive it will be to indigenous culture. If this is the case then it is likely that it is a reactive rather than proactive response to a set of problems. This could not really be regarded as being indicative of sustainability; rather, there should be evidence of cultural sensitivity where there are few associated problems. It is also notable here that the indigenous concerns being expressed within this result are primarily those associated with alcohol misuse. This is by far the greatest single issue facing remote Australian communities with high indigenous populations [32,58]. Alcohol misuse is responsible for

most crime [32], domestic violence [59] and poor health [31,60] among indigenous people and it is certainly the most important contributor to Halls Creek's low score on social basic needs. However, in this context, Halls Creek's indigenous housing is also extremely problematic; it is inappropriately designed and there is evidence of poor infrastructure maintenance (water, power etc).

Sense of security revealed an unexpected result. The lowest scores were found in Kununurra, which was then followed by Halls Creek. As just noted, alcohol misuse has been linked with petty and more serious crime, but where consumption occurs in public places, squabbling and fighting is also common. The non-drinking inhabitants commented about feelings of apprehension when encountering large groups of street drinkers, which may account for the poor sense of security scores in these communities. However, Charters Towers was also found to have a relatively low score – significantly lower than the other two Queensland towns and Jabiru. Literature confirms that, in more urbanised contexts, the elderly are more fearful of the young (e.g. [34,61–63]). Charters Towers' resident population includes a large proportion of retirees who, during the survey process, often commented about the presence of young people 'hanging around' parks and streets. It seems that it is this, rather than street drinking, that has created the impression of insecurity. Charters Towers may also be large enough to be suffering from other types of insecurity problems (e.g. burglaries) that are typical of larger towns and cities. Of course, unemployment coupled with lack of things for the young to do was also identified as a major issue of concern in most of these towns, which could help explain why the young appear to be hanging around so much.

There is a very clear and significant demarcation between the Queensland towns and the two Western Australia and Northern Territory towns with historic sensitivity. As mentioned above, this almost certainly reflects the history of the towns. Charters Towers has a relatively long history and the buildings at its centre reflect its past. Hughenden also has a long history and again it is something that is apparently valued highly by its residents despite the fact that the architecture at Hughenden's town centre is generally regarded by most as being less impressive than that of Charters Towers. Cloncurry has a similar history to Hughenden with a similar pattern of preservation of historically significant buildings – mostly hotels, public buildings, banks and public houses. Such buildings stand out as symbols of the past and they are indicative of more buoyant and affluent economic times. In contrast, Jabiru, Kununurra and Halls Creek do not have such a long or economically vibrant history. For example, none of these towns was established during the glory years of a gold rush such as was the case with Charters Towers. Perhaps more importantly, the Western Australian towns and Jabiru were not established at a time when it was considered important to 'open up' northern Australia. They were established in the 1970s and they all appear to lack architectural purpose and permanence. It is likely that these newer towns were established with one primary motive in mind – to provide services quickly to those who were developing natural resource industries in the surrounding areas (e.g. mining at Jabiru and agriculture around Kununurra). Whilst this motive was also true of the Queensland towns, it could, however, be argued that they were conceived within a greater 'pioneering ethos' – a time when motivations extended beyond mere resource exploitation and cost-effectiveness. The expense and investment evident in the architecture of the Queensland towns, particularly Charters Towers, testifies to a desire, not merely to create functional 'quick fix' buildings, but to also produce something that would impress existing and future generations. They are symbolic of intended permanence and an expectation of continued

prosperity. Evidence from the community survey would seem to confirm that the buildings of Jabiru, Kununurra and Halls Creek engender little, if any, feeling of intrinsic value. The results from one of the questionnaire items perhaps best demonstrates the point; 84.3% of respondents from Charters Towers compared to just 10.5% from Jabiru either agreed or strongly agreed that 'it is important to preserve the architectural style of buildings in the town centre'.

Scores for community involvement are very positive for all towns suggesting, in principle at least, that most residents are supportive of community involvement in decision making. This is by far the one construct to have received the most positive response from all the towns. The consistency of this result would suggest there is an important available resource in terms of *social capital* [64].

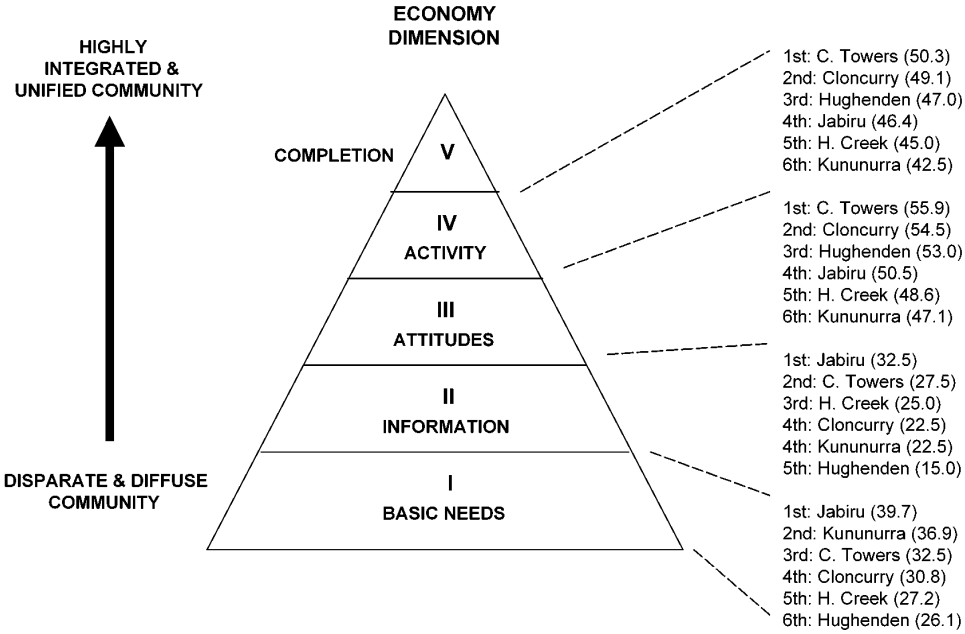
Social interaction can be considered a surrogate for community networks, which has also been associated with social capital [36,65]. In itself, the score for this construct reveals little variation between towns but it does seem noteworthy that Hughenden (the highest scoring town for social interaction) is the one town in this sample known to be suffering decline in terms of population and services. This town also scored the highest for sense of place and community involvement so it seems plausible that an argument can be forwarded that higher scores for all these are likely to be found in circumstances of economic and social decline. Perhaps it is the threat of continued decline that is helping to unite the community in Hughenden and so enhance social capital. If true, then again this response may be a reaction to negative socio-economic signals rather than the results of a proactive initiative born from something more positive. Alternatively, however, it is conceivable that the strength of these scores may be more attributable to a long history and a shared sense of identity. Only further research could answer this question but what is certain is that high social capital scores, such as those displayed by Hughenden, should be regarded as a positive attribute because, in terms of strategic planning, it offers a clear window of opportunity to install sustainability initiatives.

7 The economy dimension

The negative socio-economic signals mentioned above are clearly apparent in the results from the economic dimension also (Figure 4). Of the three dimensions examined, it is the economy dimension that scored the lowest overall, and this is particularly true at the information and basic needs levels.

It is Charters Towers that scored highest out of the six towns. The town came first on levels III and IV, second on level II, and third on level I. Again, this is consistent with the fact that it is the largest town and certainly the most diverse in terms of its economic functions. Jabiru, which scored well on levels I and II came only fourth on level III and IV. Cloncurry scored well in terms of attitudes and activity (second places) but not so highly for the other two levels (fourth place). Kununurra scored favourably on level I but poorly on all the other levels i.e. it was good at providing basic economic needs but the level of economic sustainability information, attitudes and activity were all relatively poor. Likewise, Halls Creek also did poorly on most levels including the basic needs level although it apparently had a relatively well-informed community. This is perhaps not so surprising given the sample population (discussed above). Hughenden did moderately well in terms of attitudes and activity but very poorly in terms of information and basic needs.

Figure 4 Results found on the economy dimension



Like the social dimension, factor analysis was used to establish groupings of questionnaire items. Five groups were identified: altruism, community economic support, *Dominant Social Paradigm* (DSP) central issues, future prosperity, and the time that ought to be considered in planning (Table 3).

Table 3 Sustainability support scores (%) obtained for the major economic dimensional constructs

	Altruism	*Community economic support*	*DSP central issues*	*Future prosperity*	*Time considered in planning*
Charters Towers	12.5	75.6	25	65	30
Hughenden	8.7	75	15	52.5	32.5
Cloncurry	11.2	72.5	22.5	67.5	30
Jabiru	23.7	57.5	36.2	67.5	45
Kununurra	11.2	59.4	22.5	80	45
Halls Creek	10	61.3	30	42.5	35

The altruism construct was based on two contingent valuation items that explored willingness to pay (WTP) to improve environmental protection and community involvement in development in planning decision making. As one might expect, the score for altruism was not high for any of the towns but the hypothesis that there would be a greater degree of altruism in towns that demonstrated higher incomes has, in a simple sense, been confirmed. Jabiru, the town with the greatest per capita income, also

demonstrated the greatest level of expressed financial altruism. It is also notable here that there was greater support (WTP) to protect the environment than there was for improved participation – which was true of all towns. This correlates with the overall scores found on the environment dimension.

Both community economic support and sense of place (discussed above) display very similar results and again a clear distinction is evident between the Queensland towns and those of Western Australia and the Northern Territory. The relationship between these two constructs is also supported by a Pearson's test of correlation, which showed an *r*-value of .50 (p = .01, N = 673). Given the fairly moderate scores found in Jabiru for community economic support and sense of place one must conclude that financial altruism (expressed here as WTP for sustainability) in itself should not be considered a good indicator of support for sustainability. The converse must also be acknowledged; it does not mean that altruism is not present in poorer communities – especially if they are displaying high levels of social capital and sense of place etc. It simply means they may not be in a position to finance sustainability initiatives. Strategic planners in 'poorer' communities may be surprised to find good sustainability support in the form of altruistic activity such as volunteering instead.

The DSP (dominant social paradigm) central issues construct is made up of two question items that examined attitudes towards economic growth and financial self-sufficiency. In both these, all the town's scores were relatively low – especially for self-sufficiency. Nevertheless, and following the pattern found for altruism, the town that appeared to be struggling the most (Hughenden) is the town that scored the lowest in terms of DSP central issues. The residents there evidently believe that growth is necessary to ensure the town's long-term prosperity. They also apparently believe that the idea of self-sufficiency is unrealistic i.e. they feel external financial support is necessary. If they are correct in this then government policy that seeks to encourage an 'economic level playing field' in the name of competition, efficiency and economic sustainability must be questionable in pragmatic terms. Economic sustainability in remote and regional areas such as northern Australia probably ought to be defined in such a way that it includes external financial support from the major economic centres at least until a minimum threshold population and service network is established. The exact size of that minimum threshold would have to be explored but it will almost certainly vary according to socio-political and cultural contexts. Certainly, the small rate bases and the enormity of the local municipal areas in northern Australia mean that many local authorities could virtually be considered financially bankrupt were it not for external financial support through various state or territory and commonwealth government grants.

It seems likely that the residents of the towns in this study associate future prosperity with present economic vitality but the picture is a little confused by the results from Jabiru and Hughenden. Given its economic circumstances, one might assume it would be Hughenden that would demonstrate the least amount of optimism about the future but this turns out not to be the case. In fact, Hughenden comes second last for future prosperity and it is Halls Creek that comes in last place. The reason for the apparent bleakness of Halls Creek's future seems certain to be linked to a perceived lack of 'real' economic functions, except for those that have an indigenous support purpose. However, the residents of Halls Creek should take some solace; indigenous support is a very important function and it is one that, for the foreseeable future at least, must continue. Rather, it could be argued that there should be greater concern about Hughenden's future

simply because it has very few primary economic functions at present. Even passing traffic offers little economic benefit because the town is located along a stretch of road where there are another five very similar towns offering the same roadside services.

The explanation for Jabiru's relatively low future prosperity score is easy to appreciate. Despite being one of the most economically vibrant towns, its future is actually quite uncertain because of its strong association with uranium mining – the initial reason for its establishment. Jabiru's future is also partially dependent on the town being 'normalised'. This essentially means that Jabiru's jurisdictional definition as a mining town with its current legal criteria for its management and future development, may be changed to become an 'open' town subject to normal Northern Territory local government legislative requirements. Residents seem uncertain about this prospect and what it might mean for the future of the town. It appears this is the likely reason for the lower future prosperity score. Also, broader public concern and pressure over uranium mining generally (but especially given the fact that it is occurring within the boundary of the World Heritage listed Kakadu National Park), has placed considerable uncertainty over the mine's future and therefore the town's.

The results for time considered in planning suggest that it is those towns that have all the characteristics of short-term planning and development that have scored the highest (Jabiru, Kununurra and Halls Creek). There are two possible explanations for this. Firstly, it may be a consequence of the lack of sense of place alluded to above and so reflects an inherent desire by the residents of these towns for a more 'homely' urban environment. Alternatively, could it be that the higher incomes associated with these towns enable its residents to think in the longer term and therefore support longer-term community planning and investment? It turns out that the latter hypothesis is unlikely because very little correlation was found between income and longer-term personal financial planning. Given the results for historic sensitivity (discussed above), it is more likely that the moderate desire found in the residents of these much newer towns for longer-term planning may simply be related to their daily encounters with the results of short-term planing i.e. 'cheap and cheerful' buildings. In essence, they desire a feeling of permanence and stability that can partly be found in more substantial town architecture.

8 Implications of the findings for other northern Australian towns

As mentioned above, the case study towns can be regarded as being statistically representative of five groups of towns that make up a holistic profile of the northern Australia region. So, based on the findings from the case study towns, what can be said of other towns in these groups?

The pastoral towns group was made up of six towns, all of which have very similar characteristics in terms of their environments, their social profiles and their economic functions. They are also all fairly similar in size and the range of services they provide. All these towns are located in northwestern Queensland and have a very similar history. As the group's name suggests, the towns are for the most part dependent on the pastoral industry despite the fact that most residents from Hughenden and Cloncurry believe that the industry has limited potential for ensuring long-term economic sustainability. Most towns have either stable or declining populations reflecting relatively poor economic circumstances. Given the similarities of these towns it seems reasonable to expect relatively high measures of social capital within all towns that have been associated with

this group. Of all the groups examined, it is the residents associated with the towns of this group that are probably the least environmentally sensitive although as discussed previously, there is only a very marginal variation in attitudes towards the environment between all the towns surveyed.

There are just two towns that make up the large towns' group. The main reason the clustering procedures brought these two together was because of attributes associated with their size and range of functions. However, with the benefit of hindsight, it seems difficult to be confident about Charters Towers' ability to also represent the town of Broome. It turns out that the towns have many characteristics that actually make them quite different. Charters Towers' demography is much older than Broome's (many retirees) and there seems little reason to assume that Broome would score as low as Charters Towers did for sense of security. Like the pastoral towns' group, Charters Towers is dominated by the pastoral and mining industries and whilst Broome also has the same function it is also rapidly becoming an important tourist destination with an expanding light industry. The histories of these towns are also quite different. Charters Towers' history dates back to early gold rush years in the middle of the 19th century and whilst Broome also has a long pearling history it is only since the early 1980s that the town has really 'taken off'. There is optimism about the future in Broome that was certainly not evident in Charters Towers. The economic vitality of Broome may engender feelings of belonging but one must also consider the possibility that it is attracting a *spiralist* type population. It therefore seems likely that the town would not score as well as Charters Towers for sense of place and the other constructs associated with social capital, were it to be surveyed.

This tourist towns' group contains four towns with populations ranging from just over 500 people to more than 1,700. Despite the fact that Jabiru was established to support the local uranium mine, it was statistically placed within the tourist towns' group because of the range of natural attractions presented by the surrounding Kakadu National Park and because many of the services in Jabiru catered for eco-tourism. However, this group also contains quite a diverse range of towns and again it is their various histories that demonstrate the variation. For example, Yungaburra in Queensland is also surrounded by considerable natural beauty and the tourist activity associated with the Atherton Tablelands area, but despite this, it is quite different from Jabiru. Jabiru was found to have very little historic sensitivity whereas Yungaburra apparently has a high regard for its heritage. The Eacham Shire Council's strategic plan for the town demonstrates fairly tight controls over the development and styles of buildings in the town – particularly the town's centre. One of the main attractions of Yungaburra is its heritage; something that cannot be said of Jabiru. As a consequence, there is every reason to assume that a sense of place score for Yungaburra (had it been measured) would be much higher than that found in Jabiru.

The indigenous towns' group contained five towns and whilst the towns are spread right across the northern Australia region there are certainly consistencies among them. The environmental, social and economic characteristics of the towns are all very similar, as are their histories. Importantly, nearly all the towns share another important characteristic; they have very little economic activity except for those that revolve around the provision of services to support the largely unemployed indigenous populations. It is therefore likely that all the towns in this group would demonstrate poor service provision, a high level of cultural sensitivity, evidence of indigenous associated issues (particularly

those associated with alcohol misuse), and relatively poor scores for social interaction and sense of place.

The vibrant towns' group contained just two towns – Katherine and Kununurra. Whilst Katherine is an older town and has a larger population than Kununurra, the towns share many characteristics. Young populations dominate both towns and they also have similar economies that are centred on tropical agriculture and tourism. Both are rapidly growing towns (25 and 29% population increase between 1991 and 1996 respectively) and they have similar proportions of indigenous populations (15 and 24% respectively). Although they are geographically located far from each other, they both share similar environments and have considerable existing and potential tourism attractions. These features of the towns could have qualified them for inclusion in the tourist towns' group but the clustering procedures correctly pulled them out of this group primarily because of the varied functions they provide and the rapid nature of their growth. Given these observations, making general assumptions about the nature of sustainability support in Katherine based upon findings of Kununurra would seem appropriate. It is therefore likely that Katherine would also demonstrate high scores for future prosperity but poorer scores for community economic support and other social capital type constructs.

9 Local government's sustainability achievements in northern Australia

Agenda 21 specifically identifies local government's role in implementing the principles of sustainability. It is acknowledged that community sustainability will require partnerships between individuals, groups, organisations and governments. Local government is a key player not just because it can ensure that its own practices and policies are consistent with sustainability principles, but because it can encourage all who live and work within their municipal areas to get involved in the process of bringing about sustainability. However, the interviews with local government elected members and staff suggested there are extenuating limitations and constraints placed upon local governments in remote and regional areas. Firstly, the Councils of northern Australia tend to be dominated by conservative members, which often means environmental and social issues are given a relatively low priority [66,67]. Secondly, and perhaps more significantly, there are constraints related to resources and skills within the local government organisatons. The incomes of the local authorities are strongly related to their populations and expenditure is dominated by the costs associated with the management of large municipal areas e.g. extensive road maintenance. The only exceptional case in this study was the City Council of Charters Towers. Its relatively large population and small city area has allowed the Council to support initiatives that could be regarded as being supportive of sustainability principles. These would include the *City Centre Heritage Buildings Strategy*, the household recycling program [68], community economic development (CED) type initiatives [69] and, in collaboration with Dalrymple Shire, the refurbishment of the heritage listed World Theatre [70].

The interviews with local authority staff and elected members also revealed there was little knowledge of sustainability within these organisations and even less about its associated concepts. It seems there are two principal reasons for this. The first reason is related to the educational standard and level of experience of staff employed in this quite remote region. Despite the quite attractive salaries on offer, they are simply not enough to attract the more highly skilled and well informed [71]. For obvious reasons, such staff

tends to be attracted to the metropolitan city councils. These authorities also have the financial capacity to create more specialised positions e.g. environmental officers, social planners etc. Funding such positions in the remote municipal areas of Australia usually implies obtaining financial support from state or commonwealth grants. Such funding is always tied to project-specific objectives and always has a limited life span [71]. One possible way to avoid the heavy dependence on external funding for specialist staff is for councils to organise themselves regionally and share the costs associated with such employment. Of course, this would mean that the time and responsibilities associated with the positions would also have to be shared, but such regional initiatives may also help strengthen grant applications that seek funding for such purposes.

The second reason for poor knowledge of sustainability principles is related to the hierarchical diffusion processes that should be operating to bring sustainability information down from state and territory government to the local authority level. In short, it would appear that this has been operating inadequately. As one council member put it, "they [state government] should be more active to the extent that they physically come out to the remote and regional authorities and hold seminars and workshops [on the subject of sustainability]" [72]. Effective bureaucratic networks are an important component of social capital and without such proactive initiatives, the level of information about sustaining communities will never come close to what can be seen in the larger towns and cities. The local government network organisations, such as the Australian Local Government Association, also have an important role here in ensuring that the more remote local governments are not disadvantaged in the dissemination of such information. There may be a case for the state and territory governments, perhaps in collaboration with the respective state local government organisations, to establish a 'sustainability road show', which could travel to remote regional areas, offering information and workshops on progressing sustainability at the local level. Such an initiative would do much to lift the level of awareness of sustainability in the minds of local elected members, local government staff and the wider community.

10 Conclusions

It must firstly be acknowledged that clustering procedures are heuristic in nature so one must not expect completely fool-proof results. A closer examination of all 19 towns that were initially examined in this study revealed that they all had attributes of 'uniqueness' so if one is expecting to extrapolate case study findings in detail then great care must be taken. Nevertheless, most groupings appear to have sufficiently high internal consistencies to suggest that it is possible to make general assumptions about sustainability support in many of the other towns associated with their respective groups. This is particularly true of the pastoral towns' group, the Aboriginal towns' group and vibrant towns' group. Perhaps the reliability of the clustering process could be improved with the addition of further primary data describing the towns and their associated communities. For example, it is conceivable that additional variables (perhaps those described the history and heritage) could significantly improve grouping results, even if some of these variables were developed from qualitative data. In the end, researchers in this area will have to use their own observations from their communities to decide how to trade-off reliability with efficiency and pragmatism, especially where one is attempting to identify a set of case study towns.

Researchers and even policy makers and politicians have been demonstrating increasing interest in the concept of *social capital*. The wider community is also now starting to acknowledge it as a more useful measure of community wellbeing and vitality [73]. Many of the social dimension indicators used to examine support for sustainability in this study can be linked with social capital. The constructs associated with sense of place, neighbourliness, shared emotional connection, sense of history, altruism and civic participation all seem noteworthy. The concept of *human capital* is also relevant here. According to Black and Hughes, human capital refers to the capacity of people to contribute to the community [74]. They contend it is dependent on their motivation to do so and their ability to do so as measured by their skills and knowledge. Human capacity is typically measured by such indicators as age, education, health and disability and whilst the construct was not examined in this study, identifying a measure for it would seem a logical next step in any other studies of this kind. Conveniently, data associated with educational status and health can easily be obtained from secondary data sources such as the census.

Most studies of social capital have not considered economic indicators, however it seems logical that any study of community sustainability must also consider economic wellbeing. Traditionally, economic indicators such as Gross Domestic Product (GDP) have been used to ascertain economic wellbeing at macro scales but it is becoming increasingly acknowledged that such indicators may not adequately describe wellbeing with any effect [75]. Also, such a scale is of little value to local contexts. This research has included attitude questions about local economic activity with the intention of delivering a more holistic picture of sustainability. Since the measures in this study have also integrated question items associated with environmental empathy, it would seem appropriate to regard the model and indicators presented as an early investigation into *sustainability capital*. Clearly there is much to be done in this area but developing comprehensive indicators of sustainability capital must surely be one of the most challenging and pressing areas of sustainability research. There would appear to be an opportunity to investigate further the idea of integrating social and human capital indicators with more conventional biophysical and economic indicators such as those found in State of Environment (SoE) reporting and economic development/impact studies.

References and Notes

1 Fenton, M., Macgregor, C. and Cary, J. (2000) *Framework and Review of Capacity and Motivation for Change to Sustainable Management Practices,* Report to the Australian Land and Water Audit, Theme 6: Project 6.2.1, Bureau of Rural Sciences, Canberra.

2 Dovers, S. and Handmer, J. (1993) 'Contradictions in sustainability', *Environmental Conservation*, Vol. 20, No. 3, pp.217–222.

3 Fricker, A. (1998) *Futures*, Vol. 30, No. 4, pp.367–375.

4 World Commission on Environment and Development (1987) *Our Common Future*, Oxford University Press, Oxford, England.

5 Australian Biological Diversity Advisory Committee (1992) *National Strategy for the Conservation of Australia's Biological Diversity*, Canberra: Commonwealth of Australia.

6 Falk, J., Hampton, G., Hodgkinson, A., Parker, K. and Rorris, A. (1993) *Social Equity and the Urban Environment*, Report to the Commonwealth Environment Protection Agency.

7 Cernea, M. (1993) 'The sociologist's approach to sustainable development', *Finance and Development*, December, pp.11–13.

8 Maslow, A. (1954) *Motivation and Personality*, Harper and Row, San Francisco.

9 Arnstein, S. (1969) 'A ladder of citizen participation', *American Institute of Planners Journal*, Vol. 35, July, pp.216–224.

10 Dunlap, R. and Van Liere, K. (1978) 'The new environmental paradigm: A proposed measuring instrument and preliminary results', *Journal of Environmental Education*, Vol. 9, pp.10–19.

11 Nash, R. (1990) *The Rights of Nature: A History of Environmental Ethics,* Leichhardt, NSW, Primavera Press, Australia.

12 Costanza, R., Norton, B. and Haskell, B. (1992) *Ecosystem Health: New Goals for Environmental Management*, Island Press, Washington D.C.

13 Rapport, D. (1995) 'Ecosystem health: exploring the territory', *Ecosystem Health*, Vol. 1, No. 1, pp.5–13.

14 Elgin, D. (1994) 'Building a sustainable species-civilization: A challenge of culture and consciousness', *Futures*, Vol. 26, No. 2, pp.234–245.

15 Slaughter, R. (1996) 'Futures studies: from individual to social capacity', *Futures*, Vol. 28, No. 8, pp.751–762.

16 Gale, R. and Cordray, S. (1994) 'Making sense of sustainability: nine answers to what should be sustained?', *Rural Sociology*, Vol. 59, No. 2, pp.311–332.

17 Clark, M. (1995) 'Changes in Euro-American values needed for sustainability', *Journal of Social Sciences*, Vol. 51, No. 4, pp.63–83.

18 Berkowitz, B. (1996) 'Personal and community sustainability', *American Journal of Community Psychology*, Vol. 24, No. 4, pp.441–460.

19 Buchanan, R. (1989) *Bush Regeneration: Recovering Australian Landscapes*, Sydney: TAFE Student Learning Publications.

20 Lowe, I. (1994) *Performance Measurement*, Paper presented to the Fenner Conference on the Environment, Canberra, November 1994.

21 Macgregor, C. and Pilgrim, A. (1998) 'Is landcare funding hitting the target?', *Natural Resource Management Journal*, Vol. 1, No. 1, pp.4–8.

22 Curtis, A. and De Lacy, T. (1996) 'Landcare in Australia: does it make a difference?', *Journal of Environmental Management*, Vol. 46, pp.119–137.

23 Commonwealth Department of Housing and Regional Development (1995) *AMCORD 95: A National Resource Document for Residential Development*, Canberra: Australian Government Publishing Service.

24 Grant, J., Manuel, P. and Joudrey, D. (1996) 'A framework for planning sustainable residential landscapes', *Journal of the American Planning Association*, Vol. 62, No. 3, pp.331–345.

25 International Council on Monuments and Sites (1998) *Cultural Heritage Places Policy: Visions, Policies and Implementation Strategies*, Australia: International Council on Monuments and Sites.

26 Bunyan, R. and Ray, S. (1996) *National Energy Efficient Housing Policy,* Paper presented to the Sustainability and Local Environments Conference, Sydney, 28–29 November 1996.

27 Halperin, M. (1997) *Energy Efficient Design – Not Just for a Sustainable Future,* Paper presented to the Pathways to Sustainability Conference, Newcastle, NSW, 1–5 June 1997.

28 Scott, G. (1993) 'Turn on the three 'Rs' Today', *Current Health 2*, Vol. 20, No. 2, pp.24–27.

29 Lawrence, G. (1995) *Futures for Rural Australia: from Agricultural Productivism to Community Sustainability*, Inaugural Address given at Central Queensland University, Rockhampton, September 1995.

30 Stimson, R., Baum, S. and Mullins, P. (1999) *Australia's Regional Cities and Towns: Modelling Community Opportunity and Vulnerability*, Paper presented to the ANZRSAI Conference, Regenerating Regional Communities, Newcastle, 19–22 September 1999.

31 Hudson, P. (1989) 'Diversity in small service towns in North Western Australia', in Loveday, P. and Webb, A. (Eds.): *Small Towns in Northern Australia* Darwin, Australian National University, North Australia Research Unit pp.40–79.

32 Hunter, E., Hall, W. and Spargo, R. (1991) *The Distribution and Correlates of Alcohol Consumption in a Remote Aboriginal Population*, National Drug and Alcohol Research Centre, University of NSW, Sydney.

33 Clarke, A. and Lewis, M. (1982) 'Fear of crime among the elderly', *British Journal of Criminology*, Vol. 22, pp.49–62.

34 Stafford, M. and Galle, O. (1984) 'Victimization rates, exposure to risk, and fear of crime', *Criminology*, Vol. 22, pp.173–185.

35 Putman, R. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, USA.

36 Wallis, A., Crocker, J. and Schechter, B. (1998) 'Social capital and community building (part one)', *National Civic Review*, Vol. 87, No. 3, pp.253–272.

37 Brenneis, K. and M'Gonigle, M. (1992) 'Public participation: components of the process', *Environments*, Vol. 21, No. 3, pp.5–11.

38 Sher, J. and Sher, K. (1994) 'Beyond conventional wisdom: rural development as if australia's rural people and communities really mattered', *Journal of Research in Rural Education*, Vol. 10, No. 1, pp.2–43.

39 Wildman, P. (1992) *It's Your Community, It's Your Economy: Understanding the Nuts and Bolts of Your Community Economy,* Prosperity Press, Brisbane.

40 Local Government Management Board (1994) *Sustainable Development in Rural Areas*, Local Agenda Roundtable Guidance Series No.7. GMB, London.

41 Ward, J. (1993) *Australian Community Development: Ideas, Skills and Values for the 90's*, Community Quarterly, Melbourne.

42 Kenyon, P. (1997) *Future Directions,* Public Lecture, World Theatre, Charters Towers, Queensland, August 17 1997.

43 Mollison, B. (1988) *Permaculture: A Designer's Manual*, Tyalgum, NSW Tagari Publications.

44 Lang, P. (1994) *LETS Work: Rebuilding the Local Economy*, Bristol, England: Grover Books.

45 Ward, J. (1991) *Community Development Tactics: How to Survive Economic Rationalism*, Victoria College: Educational Media Services.

46 Guy, S. and Rogers, D. (1999) 'Community surveys: measuring citizens attitudes towards sustainability', *Journal of Extension*, Vol. 37, No. 3.

47 Because of the high proportion of indigenous residents in Halls Creek only 100 questionnaires were distributed in that town. Most of the questionnaires from people of indigenous descent were completed through interview, which constrained the total quantity of informants that could be surveyed.

48 Fishbein, M. and Ajzen, I. (1975) *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

49 Holahan, C. (1982) *Environmental Psychology*, Random House, New York.

50 Ajzen, I. (1985) 'From intentions to actions: a theory of planned behavior', in Kuhl, J. and Beckmann, J. (Eds.): *Action Control: from Cognition to Behavior*, Springer, Heidelberg, pp.11–39.

51 Schuman, H. and Johnson, M. (1976) 'Attitudes and behavior', *Annual Review of Sociology*, Vol. 2, pp.161–207.

52 McMillan, D. and Chavis, D. (1986) 'Sense of community: A definition and theory', *Journal of Community Psychology*, Vol. 14, pp.6–23.

53 Shannon, A. (1996) *Sustainability and Sense of Place*, Paper presented to the Sustainability and Local Environments Conference, Sydney, 28–29 November 1996.

54 Twigger-Ross, C. and Uzzell, D. (1996) 'Place and identity processes', *Journal of Environmental Psychology*, Vol. 16, pp.205–220.

55 Watson, W. (1964) 'Social mobility and social class in industrial communities', in Devons, E. and Gluckman, M. (Eds.): *Closed Systems and Open Minds*, Oliver and Boyde, Edinburgh.

56 Pahl, R. (1965) 'Class and commuting in English commuter villages', *Sociologia Ruralis*, Vol. 5, No. 1, pp.5–23.

57 Kahneman, D. and Tversky, A. (1979) 'Prospect theory: An analysis of decision under risk', *Econometrics*, Vol. 47, pp.263–291.

58 Watson, C., Fleming, J. and Alexander, K. (1988) *A Survey of Drug Use Patterns in Northern Territory Aboriginal Communities: 1986–87*, Darwin: Northern Territory Department of Health and Community Services, Drug and Alcohol Bureau.

59 d'Abbs, P., Hunter, E., Reser, J. and Martin, D. (1993) *Alcohol-related Violence in Aboriginal and Torres Strait Islander Communities: a Literature Review*, Report No.8 prepared for the National Symposium on Alcohol Misuse and Violence. Australian Government Publishing Service.

60 Brady, M. and Palmer, K. (1984) *Alcohol in the Outback: Two Studies of Drinking*, Darwin, Australian National University, North Australia Research Unit.

61 Clemente, F. and Kleiman, M. (1977) 'Fear of crime in the United States: A multivariate analysis', *Social Forces*, Vol. 56, pp.519–530.

62 Braungatt, M., Braungatt, R. and Hoyer, W. (1980) 'Age, sex, and social factors in fear of crime', *Sociological Focus*, Vol. 13, pp.55–66.

63 Clarke, A. and Lewis, M. (1982) 'Fear of crime among the elderly', *British Journal of Criminology*, Vol. 22, pp.49–62.

64 Professor Robert Putman is perhaps best known for developing the term 'social capital'. Defined simply, it consists of networks and norms of civic engagement. Without participation in public life, Putman argued feelings of trust and bonds of reciprocal helping are undermined, and the ability to solve problems and sustain prosperity is weakened.

65 Ekins, P. and Newby, L. (1998) 'Sustainable wealth at the local level in an age of globalisation', *Regional Studies*, Vol. 32, No. 9, pp.863–872.

66 Campbell-Stewart, D. (1997) *Personal communication*, 11 July.

67 Kinnard, M. (1998) *Personal communication*, 13 July.

68 Beveridge, B. (1997) *Personal communication*, 11 July.

69 Wehlow, J. (1997) *Personal communication*, 14 July.

70 McLennan, S. (1997) *Personal communication*, 12 July.

71 McConnell, P. (1998) *Personal communication*, 14 July.

72 Hayley, J. (1998) *Personal communication*, 8 July.

73 Australian Bureau of Statistics (2000) *Measuring Social Capital: Current Collections and Future Directions*, Discussion paper, November 2000, Commonwealth of Australia.

74 Black, A. and Hughes, P. (2001) *The Identification and Analysis of Indicators of Community Strength and Outcomes*, Report to the Department of Family and Community Services, 28 February 2001. Perth: Edith Cowan University.

75 Hamilton, C. (1997) *New measures for Sustainability: the Genuine Progress Indicator for Australia*. Plenary paper presented to the Second National Ecological Economics Conference, Melbourne, 20–22 November 1997.