The capacity of local government to support adaptation to climate change: dealing with risk and uncertainty

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ABSTRACT

The coastal social ecological system of the Great Barrier Reef (GBR) is of iconic status to Australia with a major influence over the state, as well as regional and national, economy and identity. Human communities along the coast of the Great Barrier Reef (GBR) will be highly affected by global environmental change due to altered average climatic conditions, increased extreme weather events such as cyclones, and elevated sea levels. These changes will have a significant impact on the social ecological systems on which these communities depend. As the level of governance closest to the people, local govemment will play an important role is supporting their community's resilience to climate change through facilitating community involvement with policy and planning processes and co-ordinating action between different partners.

While planning is a central function of local government, climate change presents new challenges for planners in particular in terms of perceptions of risk and uncertainty. Risk management is regarded as a core characteristic of community resilience and so is emerging as a key strategy for local government response.

This paper reports on a Queensland case study of a local government area on the coast of the Great Barrier Reef. We outline why climate change is a difficult issue for planners. We will discuss the concepts of risk and uncertainty in terms of local government planning for climate change.

BACKGROUND

The Australian icon of the Great Barrier Reef (GBR) is of international ecological significance and of great national and regional social and economic importance. The GBR region, as a social ecological system, contributes approximately $5.4 billion to the Australian economy through tourism, mining, agriculture (sugar, beef, and horticulture), fishing, and aquaculture (Access Economics 2008). It has a population of around 700,000 people and covers approximately 25 percent of the land area of Queensland. The GBR region is considered to be highly vulnerable to the predicted impacts of climate change (Allen Consulting 2005).

Current predictions for the GBR region indicate a range of direct and indirect effects on the reef systems and adjacent coastal communities (Hughes 2003; Hughes et al. 2003; Hoegh-Guldberg and Hoegh-Guldberg 2004). Effects such as predicted warmer temperatures, rising sea levels, changes in rainfall patterns, and increased storm and cyclone intensity will be felt across the spectrum of landscapes and activities in the GBR region (Hennessy et al. 2007). Beyond these specific, direct, and to some degree 'predictable' effects there will be a range of indirect (e.g. increased energy demand for cooling, irregular water supply, changing agriculture) and capricious effects (e.g. change to food prices) due to the disturbance of the GBR region as a social ecological system.
To date the discussion of climate change has centred largely on national and international response (Urwin and Jordan 2008). However increasingly the importance of effective local

adaptation is being recognised (Shackley and Deanwood 2002; Bulkeley 2006). Key to effective local adaptation is the role of local government (Bulkeley and Betsill 2003; England 2006). Yet how local government is to support its constituent community to adapt to major change of any sort is not well understood. In fact, local government in Australia has generally received little attention in academic literature, particularly on complex issues (Wild River 2006).

In the GBR region, climate change is just one of many issues with which local governments are grappling. For example, the ecology of the region is already under pressure through overfishing and declining water quality (Hughes, Baird et al. 2003). Also, recent major institutional reforms by the state government, in the form of council amalgamations, have also resulted in a major reorganisation of local government. In addition, the region, like most coastal areas around Australia, has a rapidly growing population which is expected to continue to increase as Australians flock to the beach in an amenity migration (Gurran et al. 2008). For example, several coastal local governments adjacent to the GBR are among the fastest growing population centres in Queensland and Australia (ABS 2006 data). Although climate change is increasingly recognised by Commonwealth and State governments in Australia as a critical issue for coastal communities, few local planning schemes are yet to include specific provisions for climate change adaptation (Gurran, Hamin et al. 2008). For these 'seachange' areas this burgeoning growth places an additional burden on local governments as they experience pressure for rapid development approval, before climate change considerations have been factored into planning and assessment frameworks.

INTRODUCTION

Climate change is a multidisciplinary and complex challenge which has causes and impacts in environmental, social and economic systems (IPCC 2007). This complexity makes climate change a difficult issue for policy makers at all scales (Prato 2008). While consideration of the biophysical impacts are critical to adaption, in order to support the GBR region to become resilient and adapt to new conditions we need to think of climate change as more than biophysical impacts. We need also to consider other important aspects of climate change such as how to resolve issues of different types of uncertainty, manage risk, integrate various types of knowledge, and resolve conflicts over power, ethics and responsibility – and all across local through to international scales. This paper presents preliminary findings on perceptions of risk in a coastal local government area in the GBR region. Risk perceptions are critical components of the social political context and determine whether individuals will pursue or adopt climate-relevant policies (Leiserowitz et al. 2006).

While societies have always adapted to climate variability, adaptation to climate change requires making decisions about future risk in the context of many layers of uncertainty. Any decisions about adaptation occur within the context of demographic, economic and cultural change (Adger et al. 2005). Such decisions are rarely a response to climate change in isolation but are embedded within broader decision making for other initiatives such as planning for water resources, coastal resources, risk or disaster management (Adger et al. 2007). Decisions and actions for adaptations take place within hierarchical structures and through interactions within and across scales (Adger, Arnell et al. 2005). Both individual and collective actions are supported or constrained by the current knowledge, technology, regulations and social norms (Lindseth 2004; Adger, Arnell et al. 2005; Naess et al. 2005).

The capacity of local government to support their community's adaptation to change depends on a range of factors. One factor that is important for adaptive capacity to climate change is the perception of risk of climate change for the local community or region. Perceptions of risk involve judgements of the certainty or uncertainty and desirability or undesirability of particular consequences (Eiser 2004). Decisions taken by an organisation such as a local authority is comprised of decisions made both individually and collectively by people within the organisation. Thus the perception of risk of individuals determines if initial steps are taken.

Some climate change researchers consider the cognitive or rational choice model of risk perception that assumes that humans are fundamentally rational choosers (Taylor-Gooby and Zinn 2006). Other studies show that risk perception is not simple or rational: typically communities with a high physical vulnerability to the effects of climate change do not exhibit higher concerns (Norgaard 2006; Norgaard 2006; Sundblad et al. 2007). Another area of research has focussed on the personal threat posed to individuals with the general conclusion that perceived personal relevance is a powerful predictor of risk perception (Kahlor et al. 2006). However this may differ for more distant or 'impersonal' threat such seen as posed by global climate change, which draws on subjective views of risks across a range of scales (e.g. individual/community; present/future generations). Similarly, even those individuals who are aware of risks and adverse consequences usually attenuate the risks to themselves (Lorenzoni et al. 2006).

Perception of risk is also influenced by trust in institutional performance, reflecting people's confidence in both the expertise and actions of agencies and institutions that initiate and control risk (Lorenzoni and Pidgeon 2006). Judgements of risk are also influenced by the mass media which frames the issues surrounding climate (Eiser 2004, Miles and Morse 2007). Also important in perception of risk is the role of social and informal networks, which enable individual anxieties or apathies to be socially reinforced and adopted as cultural truisms (Eiser 2004).

METHODS

This research uses a case study methodology in local government in a rural community within the GBR region of Queensland. This case study is part of a broader PhD research project into the capacity of local government to support adaptation in this region.

Case studies are used extensively in social science research both in traditional disciplines and applied fields (Yin 1994). The case study as a methodology is "an empirical inquiry that investigates contemporary phenomena within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yearley 2000) p. 13). Yin (1994) recommends the use of case studies for when a research questions of 'how' or 'why' questions is being asked about a contemporary set of events over which the investigator has little or no control (p. 9). The results presented in this research are based on one case study with a local government in North Queensland.

A series of eighteen face to face, semi structured interview were conducted in July to October 2008 with people connected to the local government of the case study. This included elected councillors and shire staff (e.g. planners, environmental officers etc) as well as agency staff in organisations working with that Shire. The local government informants were purposively sampled as members of different organisational units e.g. elected councillors and departments of planning, corporate services, engineering. The elected councillors were included as it was assumed for this study that their views would broadly represent the views of the community.

The interviews took between 1-1.5 hours and were audio recorded with the informant's consent. Interviews included semi-structured questions to explore a sequence of themes to provide a rich description of the dimensions and process that underpin a particular issue or situation (Kvale 1996). Semi-structured questions are useful for capturing a diversity of views using the informant's own words.

RESULTS

Preliminary results from this study suggest the following four findings related to the perceptions of risk of climate change for this local government area.

1. There are mixed perceptions of the importance or urgency of climate change as an issue for the shire.

For most of the elected local government councillors, climate change was not raised on the list of current challenges that local government were facing. Even when asked specifically about the risk of climate change for the region these interviewees indicated that, although it may be an issue in the future, the current risk of climate change, including sea level rise, was fairly low. The perception amongst councillors was that the community was not concerned about the risk of climate change.

Some local government councillors are very sceptical – they don't believe in climate change and are suspicious of the motives underpinning the push for action on climate change:

> *We haven't still really proven that there is a problem with climate control. It's not totally proven – you'll get one group saying that things are happening - which there is. But that could have happened forty years ago and you couldn't actually have judged it. And there could have been a whole circle and it's only just coming around again now. I know a lot of people are passionate about climate change but I believe a lot of the passion about it is because it does create jobs.* LG12

> *It's like the new age thing – it's a buzz word. Some people think it's a buzzword – just creating jobs for people.* LG11

> *To me climate change isn't an issue. To me if it is then it is only a political thing where there is some that can make billions of dollars.* LG17

Some remain 'agnostic' but accept that there is an element of truth in the need for action on climate change:

> *I'm a bit of a pessimist and I'd say it (Change) probably will affect us eventually.* LG14

> *The climate change scenario says 'this and this' will happen and there will be substantial problems with the weather. I don't know – obviously we are subject to cyclone and drought to some extent – but we still don't know exactly what happens. Everything is cool at the moment but with climate change if it going to be more drought and more winds then there is going to be problems.* LG15

2. The political aspects of climate change were considered to present a greater threat in the short term than the biophysical impacts. For examples, some councillors saw the key risk of climate change as regulation and tax that are likely to be associated with change:

> *Climate change will affect us whether we believe in it or not. It's not that I'm not a believer; I just think it's being rushing very quickly – it's another form of tax. I don't think they really understand the ramifications of the things they want to do and the cost will be passed on to one person and that's the person in the street.* LG15

> *It'll be regulation for our shire. We'll be regulated. It will be a major change.* LG12

> *It's the risk of being taxed to death.* LG13

3. The low perception of risk within the community and councillors means that some council officers indicate that they find it difficult to justify or apportion resources to climate change issues. Especially when they are already overwhelmed with work.

> *Because there is only a small bucket money to spend you need surety that if you are going to do some mitigation works to accommodate for perceived changes – no one has a money tree in their backyard so it is a matter of council having more proof or evidence or factual data that you could rely upon to keep the rate payer base happy that you are going to spend x amount of dollars on a bund wall at (*location*) to stop the rising sea levels… But*

it's very hard politically to make those sorts of decisions to spend that sort of money. My one word answer is 'evidence'. LG 16

Just managing to do council core business is often a challenge – and planning for council, sea level rise at the moment isn't core business and so not necessarily high priority. I think that will change in the future but for the moment it doesn't compare to the need do their environmental health inspections every year and to keep up with waste contracts and caravan park contracts and water quality monitoring in the pools and all that sort of stuff. RB 11

4. Council officers, although they think climate change is important, they report that they lack sufficient useful information on which to make decisions on climate change or guidance on how to incorporate climate change into their planning.

I don't really understand the implications of climate change and I don't think anyone can reliably predict them yet. If anyone is able to then I am not aware of it. So I don't know what will happen to rainfall or even flooding. If it changes then it will have a significant impact here…. There isn't really a clear mechanism (for action) because of the uncertainty. LG18

They are looking for guidance from other tiers of government including other, larger councils that they perceive to have more resources.

If government encourages this climate change and can prove that we actually need it. Then they will have to make the basic runs with it. They are going to have to be the leaders in that. LG11

You would think that the bigger shires would show leadership and surge ahead given their resources and their bigger rate base and their ability to spend the money. For sure I'd jump on their back and use what ever they are doing and that's what we do do. LG16

DISCUSSION

Although the broader Australian community seems to have become more engaged with the issues of climate change there are actually still many in the community who are struggling with how to engage with the issues presented by climate change. It is difficult for decision makers to act on climate change – and apportion resources – when they don't have the support of the community. Decisions about adaptation involve 'cascading decisions across a landscape' (Adger et al 2005. p 79) of organisations and occur in the context of other day to day choices and against a backdrop of demographic, economic, environmental and cultural change. These decisions encompass stakeholders and institutions simultaneously across local, national and international scales: effective response requires integration of policy and action across these three levels of governance (Koch et al. 2007).

Yet the perception that climate change is not a significant risk for the region, combined with the layers of uncertainty about what will be the impacts of climate change has constrained adaptation response. Layers of uncertainty, coupled with different levels of problem awareness, perceptions of urgency, responsibility, and clear mandate and pathway for action at any political level has inhibited action. More reluctant decision makers are able to delay action on climate change citing scientific uncertainty and disagreement as the reason for inaction (Moser 2005). Plus there is the pragmatics of the issue such as a lack of capacity and resources including a shortage of professional, technical or political support (Allman et al. 2004). Compounded by the fact that climate change issues, particularly at the level of a local authority, is locked in to short term budgetary and political cycles (Urwin and Jordan 2008). In addition, people spend most of their time on issues that are perceived as urgent (Moser and Dilling 2004) and local government

decision makers are the same – resource- and time-poor results in 'day to day life taking precedence' over remote issues such as climate change impacts (Buckle et al. 2003).

However altering this situation is unlikely to be achieved by simply increasing the amount of persuasion or by simply providing more information. While local government report that they need more certainty to develop adaptation responses, the reality of managing adaptation response is really a lot more complex. It is necessary to identify more innovative approaches that draw on different disciplines and types of knowledge and ones that can accommodate multiple perspectives and varying value systems and worldviews.

CONCLUSIONS

While organisations are being encouraged to 'mainstream' their adaptation decisions (Swart and Raes 2007), this becomes very difficult when appropriate actions and policy at different levels are not clear or able to be easily integrated. Response is constrained by the different perceptions of risk and problem awareness. Failure to act by individual decision makers compounds to result in failure to act by organisations and governments (Bazerman 2006).

TAKE HOME MESSAGES

- Climate change as an issue goes beyond a series of predicted biophysical impacts that will have social and economic consequences. It challenges us on how to resolve issues of: different types of uncertainty, manage risk, integrate various types of knowledge, resolve conflicts over power, ethics and responsibility; and manage all of these across local through to international scales.

- Local government can play an important role in managing adaptation but is constrained by a lack of resources and expertise to manage such complex issues.

- We don't just 'need more certainty' for effective response to climate change. We need to identify more innovative approaches that draw on different disciplines and types of knowledge and can accommodate multiple perspectives and varying value systems and worldviews.

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