

Planning for resilient coastal settlements through bottom-up approaches: lessons from Shoalhaven, NSW, Australia

Silvia Serrao-Neumann¹ and Darryl Low Choy¹

¹ Urban Research Program, Griffith University, Nathan, QLD, s.serrao-neumann@griffith.edu.au

Abstract:

During the last 50 years there has been a significant development of the coastline leading to substantial population growth in coastal areas worldwide. This trend is also observed in Australia where about half of its population lives within 7 km of the coast. Coastal settlements located in low-lying coastal areas are considered to be vulnerable to climate risks, including sea-level rise, storm surges and coastal and riverine flooding. While the severity of climate risks affecting those areas may lead to widespread damage and disasters, they might generate opportunities for change to occur in their socio-ecological systems therefore improving their resilience and adaptation to natural hazards.

This paper investigates how these opportunities can be optimised through bottom-up collaborative planning approaches by focusing on the coastal local government area of Shoalhaven, NSW. Located in the southern NSW coast, many coastal settlements in Shoalhaven have recurrent risk of bushfire, riverine flooding and coastal inundation. The paper focuses on a distinctive collaborative planning initiative carried out with two coastal communities seeking to maximise opportunities to improve their resilience and adaptation to those risks. The paper describes the methodology involved in the collaborative planning process and discusses lessons learnt from both experiences which can inform future bottom-up collaborative planning initiatives.

Key words: climate change, strategic planning, human settlements

1. Introduction

Following worldwide trends of coastal urbanisation, coastal areas in Australia host about half of the current country's population (Chen and McAneney, 2006). In particular, the east coast of Australia hosts major urban centres and many smaller townships such as the ones comprised by the NSW south coast. Coastal communities, because of the uncertainty related to global environmental change, increased population growth and trend in development are likely to have increased exposure to extreme weather events in the future (Nicholls et al., 2007).

Further, economic damages associated with extreme weather events have increased through time due to both social vulnerabilities and change to physical hazards (Adger et al., 2005). While natural hazards are an ongoing part of human history, a changing climate coupled with poor landuse planning and population growth may exacerbate the exposure of communities to their impacts (Nicholls et al., 2007) and continue to challenge their ability to respond appropriately as well as their economic recovery (Gunderson, 2010). Extreme weather events resulting in disasters also lead to a range of intangible social costs such as trauma which is likely to affect 95% of people in the early aftermath of a disaster and continue to affect 10-25% of people after the immediate recovery period (Gordon, 2007). Consequently, there is an urgent need to build resilience of vulnerable communities given their exposure to extreme weather events and future environmental and social change (Adger et al., 2005).

It is argued that planning plays an important role in safeguarding communities against future climate change impacts, particularly through adaptation (Bulkeley, 2006). Adapting to climate change thus is challenging and demands a rethink in the way in which our cities and towns are planned and built (Leitch et al., 2010). Such a rethink will need to take place in partnership with communities because they are at the forefront of impacts when extreme weather events occur. Coupled events such as sea level rise and East Coast Lows leading to severe storm surges and intense rainfall events will posit significant challenges to how coastal areas on the east coast of Australia are managed as well as testing the strength of the communities inhabiting those areas. Additionally, as climate change impacts are expected to be spatially non-uniform across the world (Füssel, 2007) cities and regions will need to adapt to climate change in different ways. Many communities worldwide have experience in dealing with extreme weather events such as floods and wildfires and therefore provide important knowledge base and experience that can inform future climate adaptation. Consequently, it is important to capture the lived experience of different communities across the world in their efforts to adapt to extreme weather events as well as other environmental and social change.

While the severity of extreme weather events affecting coastal areas may lead to widespread damage and disasters, they might also generate opportunities for change to occur in their socioeconomic, political and organisational systems (Pelling and Manuel-Navarrete, 2011). This paper explores how those opportunities can be optimised by focusing on two communities from the Shoalhaven area, NSW, Australia which are in the process of developing a long term strategy for their future, independent of official planning processes of state and local governments.

To this end, the paper is structured in three parts following this brief introduction. In the first part, we present the research approach and describe the case study area. In the second part, we describe the collaborative process involved in developing this strategic planning initiative which culminated in the proposition of a long term vision and a set of priority actions for both communities. Last, we discuss how this bottom-up, community initiated and led, visioning and strategic planning initiative may contribute to inform the planning process for dealing with environmental and social change in urbanised coastal areas, including climate change adaptation.

2. Research Approach

This study adopted elements of intervention research methodology (Hatchuel, 2001). This type of research methodology, also called participatory intervention research (Daniel et al., 2011), has gained momentum over the last decades amongst sciences which deal with collective action processes (Hatchuel, 2001). It is an approach that builds on elements of action research (Hatchuel, 2001) first developed by Kurt Lewin in the 1940s (Halkup et al., 2004). Widely used in the fields of human health where it is referred to as community-based participatory research (Halkup et al., 2004; Wallerstein and Duran, 2011) and management research (Hatchuel, 2009), it comprises a type of research which allows collaboration / interaction between actors and researchers to generate the means for collective action (Daniel et al., 2011). Midgley (2008) defines intervention in the context of research methodology as a “purposeful action by an agent to create change” (pp. 56).

Advantages of adopting this type of research methodology include its contribution to aiding decision-making processes, and the fact that researchers play a dual role of investigators and stakeholders in the process which can increase its path to impact (Daniel et al., 2011). Furthermore, intervention-research is conducive to bring about positive change (Midgley, 2008).

In adopting research-intervention as our methodology we created a broader scope for the collaborative component of the study. Advantages of establishing collaborative approaches in the planning context are well discussed in the literature and extensively represented by the work of Patsy Healey (2006, 2008). Specifically, collaborative planning provides opportunities for the deliberation and debate of critical issues in policy-making practices (Healey, 2008, pp. 285). In such collaborative approaches, negotiations between stakeholders assist in determining which focal issues are to be included or discarded in the planning process, and responsibilities and accountabilities associated with the plan-implementation process (Daniel et al., 2011).

In our context, the research comprises a partnership between researchers and stakeholders from two separate communities: the Conjola and the Sussex Inlet Districts. This partnership seeks to collaboratively conceptualise and develop a long-term strategy for each community's future. The research follows a two-pronged approach related to data collection, including:

- a) Literature review and background research; and
- b) Workshops with community stakeholders following a scenario planning approach to prepare a community-based strategic action plan.

The literature review and background research involved assembling and analysing background planning data, secondary documents and climate change data; confirming key existing and potential planning initiatives for ongoing engagement by the Conjola and Sussex Inlet Districts' communities (including planning process opportunities and initiatives); and identifying potential natural and socio-economic triggers for the area. Workshops with community stakeholders enable the preliminary investigation of community networks and essential steps of community bottom-up approaches that may lead to improved community resilience and adaptation to future environmental and social change, including natural hazards and climate change.

2.1 Conjola and Sussex Inlet Districts

The Conjola and Sussex Inlet Districts are located in the NSW south coast, Australia, approximately 200km South of Sydney and 50km and 47 km South of Nowra, respectively (BMT WBM Pty Ltd, 2007) (see Figure 1). The Conjola District has a population of approximately 1,154 (Australian Bureau of Statistics, 2011a) and comprises three main townships: Lake Conjola, Conjola Park and Fisherman's Paradise. Sussex Inlet & District has approximately 4,000 inhabitants (Australian Bureau of Statistics, 2011b) distributed across five townships: Wandandian, Sussex Inlet, Swanhaven, Cudmirrah and Berrara. The surrounding natural beauty makes both areas a popular destination for tourists and the local population can increase significantly during the peak tourism season. Consequentially the region has a range of services, facilities and activities to support the tourism industry.

Conjola and Sussex Inlet experience a seasonal subtropical, but mostly temperate, climate characterised by warmer summers and cooler winters. The region has an average yearly rainfall of 1058mm. The majority of rain falls from February to June. In addition, East Coast Lows that

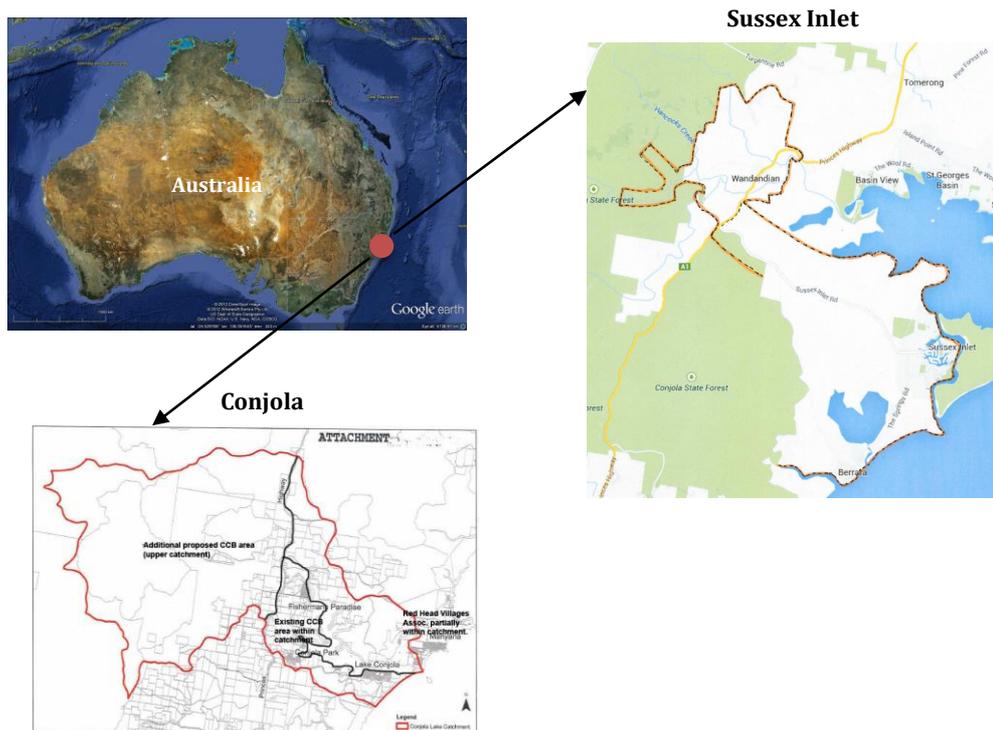


Figure 1. Location map for Shoalhaven, Australia (source: Google Earth)

form over the ocean during winter cause intense rainfall that raises the water levels of existing lakes and lagoons, sometimes flooding low-lying areas (Bureau of Meteorology, 2013). Many parts of the Districts have been developed on low-lying lands adjacent to the coast and in river valleys (BMT WBM Pty Ltd, 2012). In times of non-flood, these areas offer lifestyle opportunities highly sought after by permanent and temporary residents alike. However, significant flood risk with the potential for frequent and severe inundation from a number of flooding sources is very high. The main causes of flooding in the area are: significant catchment rainfall, oceanic inundation and low-level persistent flooding from elevated lake water levels, particularly when the lake entrance is closed (BMT WBM Pty Ltd, 2012).

Recent flood experiences across Australia have demonstrated the devastating impacts of flooding with many 'never seen before' or 'worst flood on record' events (BMT WBM Pty Ltd, 2012). These events highlight the susceptibility of development on flood prone lands. Unfortunately for the residents of Conjola and Sussex Inlet, the nature of flooding in the area is such that severe flooding problems can occur with very little warning (BMT WBM Pty Ltd, 2012). In particular, the Conjola District is also exposed to coastal hazards. The District contains homes and services located in low-lying areas adjacent to Conjola Lake (see Figure 2). Conjola Lake is referred to as an Intermittently Closed and Opened Lake/Lagoon (ICOLL), which features a sand barrier that creates a constricted entrance allowing the intermittent exchange of water between the central basin and the ocean. The Lake entrance shoals constantly change due to floods, tidal flows, storm-waves littoral sand supply and wind-blown sand from Conjola Beach. The entrance can remain closed for years in the absence of rainfall events and/or mechanical intervention, but has mostly been classified as open over the past 20 years (Shoalhaven City Council, 2012). Lake Conjola's coastal landscape is continually changing due to natural forces of wind, waves, rainfall and tides as well as human interventions (Umwelt,



Figure 2. Lake Conjola (source: NSW Estuary Management Program, 2000)

2012; SMEC, 2008). Coastal hazards and influences in Lake Conjola include: storm surge, coastal inundation, creek entrance migration and lake entrance condition, and climate change and sea level rise.

In comparison, Sussex Inlet and District has been affected by a number of serious bushfires through the years (see Figure 3). In particular, the area has been affected by two significant fire events that occurred during the 1990s (NSW Rural Fire Service, 2013). About 80% of the catchment area comprising Sussex Inlet and District (St Georges Basin) remains forested (Norman et al., 2012). The risk of bushfires is likely to increase due to future climate change which is forecast to lead to reduced rainfall averages and increased average temperatures in south east Australia (Hennessy et al., 2007).

2.2 The Collaborative Process

The collaborative process of developing a long-term strategy for the Districts comprises a series of workshops involving community stakeholders. Workshops are sequenced so as to enable the establishment of a partnership between stakeholders and the research team to develop and confirm a vision for the future of their community (see Figure 4 for example); identify a series of future options for the community; and compose an action plan which contains a series of prioritised actions that will have to be implemented over the life of the action plan in order to achieve its vision and strategic intents.

The last step in the process is to disseminate the action plan to the wider community as well as authorities from both local and state governments. Ultimately, it is expected that the proposed future options will be integrated and incorporated as part of the review of official plans and strategies that have direct implications for each community.



Figure 3. Bushfire damage along the Illawarra ranges in 2013

Vision Statement - Conjola

Lake Conjola District will continue to be acclaimed by its natural beauty. It will become an inspirational model of a community living and working together to adapt and respond to natural hazards and reach common and sustainable solutions which protect and conserve the lake and its catchment for future generations.

The District's congenial character is retained within the footprint of the existing settlements to serve the needs of residents and visitors within the area's sustainable limits.

Vision Statement – Sussex Inlet

Sussex Inlet and District remains a safe, strong, resilient, caring and sharing community respecting our natural environment, providing opportunities for lifestyle choices embracing future challenges.

Figure 4. Example of community visions

The compilation of future options for the community involves an iterative process in which community members are given the opportunity to submit a selection of options for assessment at one of the workshops. Options are assessed against two plausible future scenarios and, generally, guided by five 'what if' questions:

- The extent to which the option would enable the District to deal with future major natural hazards;
- The extent to which the option would enable the District to deal with future shocks and surprises (e.g. economic downturn, collapse of the international and national tourism industry, dramatic changes to oil availability);

- The extent to which the option would represent the best use of public money;
- The extent to which the option would have a negative impact on the District; and
- The extent to which the option would assist the District to fulfil its Vision.

Elements that comprised the action plans for each District ranged as follows:

For the Conjola District, 29 future options were developed distributed across four themes: Social and Community Well-Being, Preserving Natural Beauty and Environment, Resilience/Emergency/ Disaster Management, and Economic Development and Sustainable Solutions. For the Sussex Inlet and District, 27 future options were drafted thus far distributed across eight themes: Disaster Management, Town Planning, Economic Development, Infrastructure, Tourism, Environment, Social/Local Capacity, and Youth.

3. Discussion

Understanding how communities value their place and wish to plan for their future is of critical importance considering the planning challenges posed by current and future social and environmental change, especially to government agencies from all levels as they seek to support and meet the needs of these communities. The use of intervention-research is perceived to be a useful approach to generate such understanding. For example, drawing on workshop outputs, two characteristics were identified in the Conjola District community¹ that are understood in the literature to be important elements that assist communities to deal with shocks such as disasters caused by natural hazards (Airriess et al, 2008; and Samper, 2008). These include place attachment and well-established social networks. These two characteristics became evident during workshop 1, when participants undertook a SWOT analysis to identify the community's strengths, weakness, opportunities and threats. In doing so, participants were able to identify key characteristics of their District and community that contribute to defining a strong sense of belonging. This was exemplified by the high valorisation of their lifestyle which is enabled by the attributes of their area, including its natural environment, its lack of urban development, its peacefulness, and its close-knit community with caring and helpful neighbours.

This paper also confirms the usefulness of intervention-research in supporting collaborative planning as it generates important information related to the community's values and interests that should be discussed and potentially incorporated in future plans for their area. Such values and interests were identified through the iterative process of developing and assessing future options for their community which ultimately have the potential of enabling the Conjola District community to deal with future environmental and social change. The extent to which the future options will be incorporated in future official plans is yet to be determined and their effectiveness will continue to be tested in the years to come as the action plan is widely disseminated to both the broader community and government agencies.

Additionally, collaborative planning processes enabled through intervention-research, such as the one outlined in this paper, have the potential to address complex and highly contested issues of interest to local and state governments, including climate change adaptation (Head & Ryan, 2003; Innes & Booher, 2004; Horlick-Jones et al, 2006). Nevertheless, these collaborative planning processes need to be continuously evaluated to ensure their legitimacy, effectiveness and robustness particularly associated with the plan-implementation phase. Such evaluation would involve a number of key criteria as proposed by Holkup et al (2004), including: credibility, transferability, fairness, level of participant involvement, community voice, acceptable problem solution and feasibility of project sustainability. Hence, more

¹ Observations related to the Sussex Inlet & District community are yet to be fully unpacked as the first workshop is being held after the submission on May 23rd.

longitudinal studies would be required to confirm the role of collaborative planning in improving community outcomes, effectively addressing future environmental and social change as well as providing important lessons that can inform other collaborative planning initiatives.

Specifically, based on the cases presented here, special attention needs to be given to power relation issues as well as personal-interest driven participation by some community members (Head, 2007; Renn, 2006). Nevertheless, the opportunity for deliberation to occur as part of the collaborative process enables individuals to expose their aspirations and ideas that, sometimes, are not heard by other members of the community due to past tensions. Hence, agreed processes also need to be put in place to deal with potential conflict resolution that emerges during the plan-making process but, most importantly, during the plan-implementation stage.

A key learning that emerged from working with both communities relates to how community engagement in the planning sector needs to be carried out over a longer period of time to ensure greater breadth of participation and ownership building. In the case of the Sussex Inlet District, the researchers opted to adopt an ethnographic approach during the project which has resulted in greater representation of different sectors of the community in the process of developing their action plan. It was through extended periods of time spent in the community that relationships between researchers and community members were strengthened enabling trust to be built and open dialogue. Consequently, this experience suggests that the effectiveness of statutory community engagement could be significantly improved if local and state government personnel were able to adopt a similar ethnographic approach. Whilst such ethnographic approach would require greater financial and human resource investment on behalf of governments undertaking community engagement initiatives, it would contribute to potentially regain much needed trust in governments and improve communities' understanding of the limitations faced by authorities in addressing all their aspirations.

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