

# PLANNING FOR RESILIENT FLOODPLAINS THROUGH BOTTOM-UP APPROACHES: LESSONS FROM SHOALHAVEN, NSW, AUSTRALIA

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## Abstract:

Recent floods in Australia have caused severe damage to both public and private assets and infrastructure. Many Australian urbanised areas bear a legacy of past planning decisions that allowed development to occur in low-lying areas placing many people at risk of flooding. Across the country, climate change projections indicate that there will be an increase in the intensity of extreme rainfall events despite a decrease in annual mean rainfall. Hence, flood risks in low-lying areas are likely to increase and communities need to be better prepared to deal with those risks. While the severity of flood risks affecting those areas may lead to widespread damage and disasters, they might generate opportunities for change to occur in their social-ecological systems therefore improving their resilience and adaptation to natural hazards. In particular, such change may lead to better-prepared communities which are not only likely to better respond to emergency situations but also better recover from them.

This paper investigates how these opportunities can be optimised through bottom-up collaborative planning approaches by focusing on the local government area of Shoalhaven, NSW. Located in the southern NSW coast, many human settlements in the Shoalhaven have recurrent risk of riverine flooding that can be exacerbated when combined with coastal inundation. The paper focuses on a distinctive collaborative planning initiative carried out with the Sussex Inlet & District community seeking to maximise opportunities to improve its resilience and adaptation to those risks. The paper describes the methodology involved in the collaborative planning process and discusses lessons learnt which can inform future bottom-up collaborative planning initiatives seeking to improve community resilience and adaptation to natural hazards.

**Key words:** collaborative planning, disaster planning, disaster recovery, climate change, community

## 1. Introduction

Public participation in decision-making processes has intensified over the last two decades as a result of a paradigm shift from government to governance (Healey, 1992; Reddel, 2002). These changes on the broader political and public administration arena also gave emergence to alternative approaches to urban and environmental planning processes (Healey, 1992). It is argued that greater public engagement in planning processes enable decision-makers to not only identify what the public interests are but also incorporate them in their decisions (Innes and Booher, 2004). Additionally, it may contribute to legitimizing the decision-making process and enhancing the civil society capacity in being adaptive and able to deal with complex and contested problems (Innes and Booher, 2004; Horlick-Jones et al., 2006).

In the Australian context, the focus on public consultation became a central point in public policy in the late 1990's (Adams and Hess, 2001; Brackertz and Meredyth, 2009). As a result, decisions in the urban and environmental planning sector have also sought to include increased public consultation, mediation and collaboration (Friedmann, 1993). By increasing public engagement in decision-making, the planning process is being forced to address different set of values and interests that often conflict and require mediation. It also means the establishment of new alliances between stakeholder groups that earlier planning practices have not needed whilst avoiding the dominance and predominance of specific sectors, actors or stakeholders upon the decisions (Allmendinger and Haughton, 2007).

Despite the recognition of the important role of public engagement in decision-making, examples of effective initiatives are rare (Dovers, 2003a; Head, 2007). For example, many attempts to engage the public in decision-making processes are often episodic and tokenistic, lack the provision of robust information to participants and stronger support in the form of resources and other legislative instruments (Head, 2007; Mercer and Jotkowitz, 2000). Others are characterized by approaches whereby government agencies strongly control the process, pre-define stakeholders' role and pre-frame the consultation agenda in terms of its timing, publicity and reporting (Wagenet and Pfeffer, 2007). These approaches often conceive public engagement as an item in the 'check off' list which greatly impede their impact and efficacy, instill a lack of trust and further aggravate the public's 'apathy' and 'consultation fatigue' in engagement initiatives (Wagenet and Pfeffer, 2007; Mercer and Jotkowitz, 2000). Yet, it is important to draw on past experiences and the lessons they bring regardless of their successes or shortcomings (Dovers, 2003b).

With respect to flood management, there has been a shift away from flood protection measures to flood risk management which seeks to include affected parties (e.g. communities) in decision-making processes (Evers et al., 2016). One of the benefits associated with public engagement in decision-making points to the opportunities for social learning, both individual and community interaction learning, to occur (Benson et al., 2016). This includes learning new things about floods as well as creating trusting relationships and developing networked relations. Additionally, it is argued that greater public engagement can contribute to increasing community resilience to natural hazards based on their role in improving how they plan, respond and recover from impacts (Coates, 2015). Thus, in engaging the public in flood risk management there could be social learning about: (i) the status of the problem, (ii) possible solutions and associated consequences, (iii) other people's and groups' interests and values, (iv) intrinsic personal interests, (v) holistic and integrative thinking and its use and application, and (vi) communication methods, tools and strategies conducive to enabling consensus and integrative thinking (Webler et al. 1995 cited in Evers et al., 2016).

This paper describes a collaborative planning initiative carried out with the Sussex Inlet & District community seeking to maximise their opportunities to improve their resilience and adaptation to natural hazards risks, including flood and coastal inundation. In particular, it discusses lessons learnt from this initiative regarding four of the abovementioned items related to social learning: (i) the status of the problem; (ii) possible solutions and associated consequences; (iii) other people's and groups' interests and values; and (iv) holistic and integrative thinking and its use and application. Additionally, it outlines adopted strategies to address key challenges concerning public engagement, including consensus building, motivating participation and inherent representativeness.

## 2. Method

### 2.1 Case study area

Many parts of Sussex Inlet & District, particularly those surrounding St Georges Basin, are flood prone. The Sussex Inlet channel, the tributaries and their immediate adjoining areas are classified as high hazard floodway. The Basin and the low laying developed areas of Sussex Inlet are defined as high hazard flood storage areas. The main causes of flooding in the area are: elevated basin and creek levels due to intense rainfall over the catchment and elevated ocean levels/ tides (Shoalhaven City Council, 2006).

Climate change is expected to lead to changes in annual average rainfall patterns in the area between -13% and +7% by 2030 as well as increase the risk of intense rain periods (that is number of 1 in 40 year one day rainfall events) between -3% to +20% (Echelon Australia Pty Ltd., 2010). Additionally, coastal hazards and patterns of coastal erosion can also be influenced by changes in the climate such as increased frequency and/or intensity of severe storm events; sea level rise; changed wave height and direction; and changed rainfall, runoff and storm patterns (Department of Climate Change, 2009).

Flood management in the Sussex Inlet & District has evolved in the last 20 years with flood management strategies being implemented at both state and local levels. Flood risks within the Sussex Inlet area are managed under the *St Georges Basin Floodplain Risk Management Plan* (Shoalhaven City Council, 2006). The Plan details a range of measures that can assist in reducing flood damage, including flood modification measures, property modification measures and response modification measures.

### 2.2 The collaborative process

This collaborative process aimed to derive a long term strategic Action Plan for the Sussex Inlet & District, Shoalhaven, NSW, that will assist the local community to maximise their capacity to be better adapted and resilient to natural hazards, a changing climate and economic, social and environmental impacts. The community of interest involved in the development of the strategic Action Plan included the current locations covered by the Community Consultative Body (CCB) for the

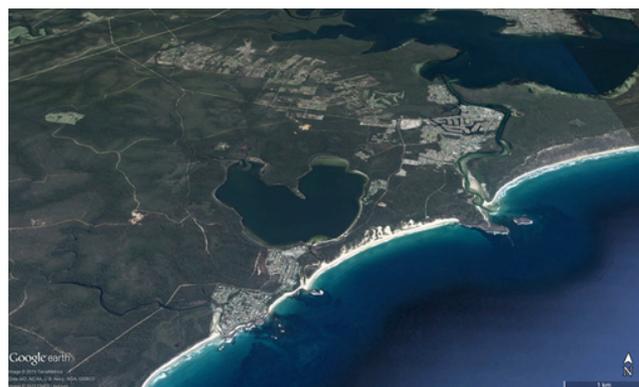


Figure 1. Sussex Inlet and District

Sussex Inlet & District and involved representatives from Sussex Inlet, Swan Haven, Cudmirrah and Berrara, including Wandandian (see Fig. 1).

The development of the Action Plan was carried out through a series of six community engagement activities held between March 2015 and March 2016. The aims of the activities were to create a vision for the District's future and a strategic Action Plan to guide management actions and development toward that vision. The key steps taken towards developing the strategic Action Plan for the Sussex Inlet & District community included:

1. A preliminary scoping community forum in March 2015. This community forum aimed to build negotiations with stakeholders to establish the process to develop the strategic Action Plan for the Sussex Inlet & District. The forum involved:
  - i. Defining a 'Community of Interest' relevant to the Sussex Inlet & District strategic Action Plan;
  - ii. Scoping of a planning and engagement process for the community, including the identification of community groups that could be involved in the development of a strategic Action Plan;
  - iii. Scoping of the attributes of the Sussex Inlet & District community; and
  - iv. Establishing a community working group and a core liaison group to lead the development of the Action Plan.
  
2. First workshop in May 2015. This workshop started the process of developing the Action Plan. During this workshop participants:
  - i. Confirmed the Sussex Inlet & District community of interest, including in-depth identification of community networks;
  - ii. Completion of a SWOT analysis of the Sussex Inlet & District future;
  - iii. Definition of a long term Vision for the Sussex Inlet and District (see Box 1);
  - iv. Definition of community priorities; and
  - v. Scoping of options for community responses to future natural hazards and disasters.

**Box 1: Vision Statement**

*Sussex Inlet and District remains a safe, strong, resilient, caring and sharing community respecting our natural environment whilst evolving into a more vibrant, inclusive, attractive, and inviting place, providing more economic and social opportunities through a variety of recreational, social and cultural infrastructure that highlights the area and its connection to the water.*

3. Second workshop in August 2015. The first of two scenario planning workshops which aimed to develop scenarios to guide the development and testing of future options for the Action Plan. During this workshop participants:
  - i. Identified, classified and ranked future drivers of change that may influence the District community in the next 20+ years;
  - ii. Developed a scenario framework to guide the preparation of the Action Plan; and
  - iii. Defined and selected two scenarios to test future options for the Sussex Inlet & District.

4. Third workshop in October 2015. In preparation for this workshop community members were invited to submit ideas to compile a suite of Future Options to be included in the strategic Action Plan. Additional ideas were added to the compiled list by the research team upon further consultation with community members. During this workshop participants:
  - i. Discussed, revised and expanded on the preliminary Future Options submitted by community members;
  - ii. Scoped additional Future Options to fulfil identified gaps in achieving the Vision statement; and
  - iii. Composed a final list of Future Options to be tested at the second scenario planning workshop.
5. Fourth workshop in November 2015. The second scenario planning workshop in which participants assessed Future Options against two scenarios, and anonymously attributed priority to each Option. During this workshop participants:
  - i. Confirmed the compiled list of Future Options;
  - ii. Assessed Future Options against 'what if' questions;
  - iii. Tested Future Options using two scenarios; and
  - iv. Allocated priority to each Future Option through anonymous individual voting.
6. Fifth workshop in March 2016. Prior to this workshop, the draft strategic Action Plan was circulated to the wider community to seek further feedback. During this workshop participants:
  - i. Discussed received feedback;
  - ii. Revised final list of Future Options to be included in the Action Plan; and
  - iii. Discussed the preparation for the first public meeting to present the Plan to the wider community.
7. First Public Meeting in April 2016. The draft strategic Action Plan was presented by the working group and attendees were invited to provide further input into the Action Plan by submitting their feedback to the research team. The research team revised the draft Action Plan and prepared the final document.
8. Second Public Meeting in May 2016. Amendments to draft strategic Action Plan based on feedback received after the First Public Meeting were presented to obtain final endorsement of the strategic Action Plan by the wider community.
9. Launch of the Action Plan. The final step in the process will be to disseminate the strategic Action Plan to the wider community as well as authorities from both local and state governments. Ultimately, it is expected that the proposed Future Policies put forward by the *Sussex Inlet & District strategic Action Plan 2015-2030* will be integrated and incorporated as part of the review of official plans and strategies that have direct implications for the District.

### **2.3 Scenario planning**

Central to the development of the Action Plan was the use of scenario planning - a strategic approach that can be used to assist decision-makers to plan for uncertain futures.

The scenario approach allows users to develop and test plans, strategies and policies against a range of plausible futures. Planning for the future needs a structured systematic approach to explore the range of possible futures rather than relying on the prediction of a single expected or 'most-likely' future. To this end, scenario planning involves:

1. The identification of a focal issue;
2. Assessment of certain and uncertain drivers of the issue over a particular timeframe;
3. The development of options based on those drivers – i.e. creation of scenarios;
4. The development of narratives from the present to the possible futures (including a 'roadmap' for each scenario with signposts that indicate if one future is becoming more likely); and
5. Testing existing plans, strategies and policies against each scenario.

Scenario planning is based on the premise that the future is not "knowable" – any statements, stories, narratives or scenarios about the future are hypothetical possible futures that may or may not be realised. Each scenario involves the consideration of: likely trends; uncertainties; as well as possible shocks and surprises (welcome and unwelcome).

Cork et al. (Cork et al., 2005) have identified the following steps to futures analysis:

1. Identify factors that brought about change in the past;
2. Identify factors that could bring about change in the future;
3. Separate what is relatively certain from what is uncertain about the future;
4. Explore the range of ways in which uncertainties could play out (often using carefully constructed 'stories' or 'scenarios' to test logic and communicate key messages); and
5. Identify what needs to be done now to prepare for later.

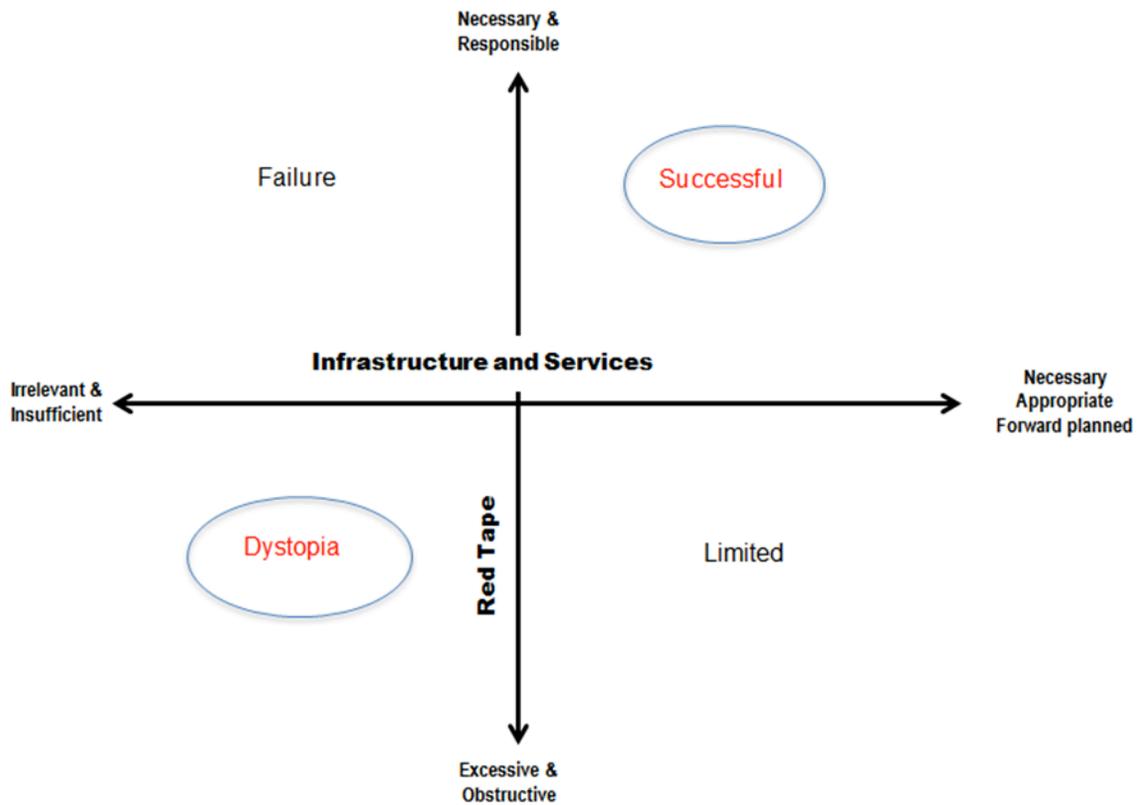
This should include the development of 'roadmaps' (plausible narratives) from the present to the possible futures. It also involves the identification of 'sign posts' which are indicators of possible future scenarios being realised. Once constructed, the scenarios can then be used to evaluate and refine existing or proposed strategic plans, policies or decisions. For example, proposed strategies can be assessed in terms of their suitability to improve the community's ability to deal with future natural hazards and economic shocks as well as their value for public money.

Two plausible scenarios that may influence the future development of the Sussex Inlet & District were developed at the second workshop. These scenarios were based on two themes:

1. Red Tape; and
2. Infrastructure and Services

The themes can be contrasted diagrammatically as two axes displaying a range of possible outcomes (see Fig. 2). The first axis describes levels of red tape. The second axis describes the level of infrastructure and services. These scenarios comprise plausible futures for the Sussex Inlet & District that may or may not be realised. These scenarios, called 'Successful' and 'Dystopia', were used to test a range of possible Future Options for Sussex Inlet & District at the fourth workshop and can be described as:

1. 'Successful' – where the Sussex Inlet & District is characterised by a high level of infrastructure and services and a necessary and appropriate level of red tape.



**Figure 2. Scenario Frameworks**

2. 'Dystopia' – where the Sussex Inlet & District is characterised by an irrelevant and insufficient provision of infrastructure and services, and an excessive and obstructive level of red tape.

#### **2.4 The Sussex Inlet & District strategic Action Plan 2015-2030**

The purpose of the *Sussex Inlet & District strategic Action Plan 2015-2030* is to establish priority actions that will enable the community to successfully engage with existing and future planning processes as well as take opportunities as they present themselves in order to achieve outcomes that will promote a high degree of liveability for their area. It is a long term strategic Action Plan – i.e. twenty to twenty-five years into the future. It includes 27 policies grouped under eight themes: disaster management, economic development, tourism, youth, environment, community development, town planning and infrastructure. A brief summary of these policies is provided next:

- a) Disaster management- improved disaster management coordination and collaboration, relevant resources such as communications infrastructure, a local SES unit, and support for vulnerable people in the District.
- b) Economic development- support for diversified businesses and employment opportunities.
- c) Tourism- a visitor information centre and town beautification scheme.

- d) Youth- improved employment opportunities for youth in the area, avenues for youth engagement in volunteering and training activities, and a youth centre.
- e) Environment- an environmental education program to enable community to cope with environmental change and hazards.
- f) Community development- to encourage and maintain volunteer participation in emergency services, celebrate cultural heritage, and better integrate young families in community groups.
- g) Town planning- related to the implementation of the Shoalhaven Local Environmental Plan, building codes, and a land capability study to address a number of potential issues (such as retreat of buildings from flood prone areas, areas for future development with relatively low flood risk, future sea level rise, and future accommodation choices and land tenure).
- h) Infrastructure- improved communications services, and alternative road access to Sussex Inlet, greater connectivity in the District and improved signage.

The assessment of the Policies proposed for the Sussex Inlet & District involved two steps. In the first step, Policies (Future Options) were assessed against five 'what if' questions as part of a collective exercise. In the second step, the relative importance of Policies in terms of their level of importance was determined through an individual voting exercise.

The assessment of the Policies against the five 'what if' questions aimed to determine:

1. The extent to which it would enable the Sussex Inlet & District to deal with future major natural hazards;
2. The extent to which it would enable the Sussex Inlet & 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);
3. The extent to which it would represent the best use of public money;
4. The extent to which it would have a negative impact on the Sussex Inlet & District; and
5. The extent to which it would assist the Sussex Inlet & District to fulfil its Vision.

Each of the Policies was rated against each of the 'what if' questions according to a three point system where:

- Three points indicated a high extent;
- Two points indicated a medium extent; and
- One point indicated a low extent.

In the second step, Policies were assessed anonymously and individually to identify their relative importance in terms of their level of priority. The five priority levels used were: very high, high, moderate, low and very low.

With respect to the implementation of the Action Plan, Policies are of a strategic nature and intended to be implemented through a number of existing local, state and federal government planning processes and initiatives. This requires close engagement by the Sussex Inlet & District community with these various planning processes and liaison with the relevant government agencies. Overall implementation of the strategic Action Plan will be coordinated by a designated umbrella community-based organisation (in this case the Sussex Inlet and District Community Forum) with support from community members upon endorsement from the broader community. This organisation will have the overall responsibility for implementing the Action Plan and establishing sub-committees or working groups to implement individual policies. An adaptive management framework will need to be designed and incorporated into the Action Plan to facilitate future upgrades and revisions to the Action Plan in the light of new science, and improved knowledge and

understanding, particularly with regard to climate change and the incidence of natural hazards.

### **3. Discussion**

One of the benefits associated with public engagement in decision-making relates to potential social learning that participants may develop through their participation in engagement activities (Evers et al., 2016). In this paper we explore examples of social learning due to community member's participation in the development of the Action Plan from a cognitive perspective, including what they learnt about: (i) the status of the problem, (ii) possible solutions and associated consequences, (iii) other people's and groups' interests and values, and (iv) holistic and integrative thinking and its use and application.

The breadth of policies included in the Action Plan reflects, to some extent, how much workshop participants learnt about the abovementioned aspects. For example, it was highlighted at the public meeting that to strengthen the District's ability to deal with future natural hazards, including floods, it was imperative to also seek opportunities through the Action Plan for improving its economy. This example reflects not only the knowledge about the problem (natural hazards risks affecting the area) but also its interconnection with other sectors (local economy). Additionally, while tourism was understood to be the key draw card for the area, and therefore comprises its key industry, it was stressed how important it is to ensure, through the Shoalhaven City Council's Local Environmental Plan, that the area continues to retain its unique natural setting represented by its waterways and bushlands. This example highlights the understanding of how possible solutions (improved tourism opportunities) may have undesirable consequences (loss of environmental quality) therefore demanding holistic and integrative thinking when planned and implemented. By participating in the process of developing the Action Plan, community members also had many opportunities to discuss, discover and respect other people's and groups' interests and values. This learning was enabled by the opportunities created in the collaborative process for community members to put their ideas in the form of Future Options which were discussed and assessed by workshop participants.

Based on Arnstein's public participation ladder, the lowest level of participation is characterised by processes in which information flows only one way (Arnstein, 1969). Conversely, the highest level of participation involves initiatives which promote two-way information flows. Hence, to maximize public engagement, passive techniques such as town meetings, information sessions, surveys and submissions should be avoided in favour of more active ones, including citizens forums, roundtables, inquiry groups, open space technology and deliberative dialogue (Hindmarsh and Matthews, 2008). The role of public participation under these approaches seek to build consensus, thereby it requires an early involvement of stakeholders in the process, the provision of robust information to participants, a greater diversification of participants as a form of improved representativeness, and endeavour to have a collaborative agenda setting process (Videira et al., 2006; Hindmarsh and Matthews, 2008). From its onset, the collaborative process described in section 2.2 sought to engage community members early in the process to scope out and develop the Action Plan. Assisted by the research team, the series of workshops enabled community members to jointly identify a desirable and preferred future for their district exhibited in the vision statement (see Box 1), and in the suite of policies outlined in the Action Plan to achieve this vision.

Notwithstanding, there are challenges to implementing effective community engagement initiatives (Head, 2007). First, there is the spatial scale at which such engagement occurs and associated limitations in transferability given the variety of communities' geographical,

political and institutional contexts. Second, there is great difficulty in improving the capacity and motivation of citizens to participate. For example, while some authors claim that the increase in public participation in decision-making was greatly influenced by a wide disenchantment with the state and lack of trust in representative democratic systems (Healey, 1992; Connelly and Richardson, 2004), public engagement can be difficult due to observed 'apathy' and 'consultation fatigue' that can emerge not only from participants' lack of interest in the subject but also lack of trust in the process (Eshuis and Van Woerkum, 2003; Connelly and Richardson, 2004; Hartz-Karp, 2004). To address these challenges, the research team 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 (Serrao-Neumann and Low Choy, 2015). 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.

A consistent group of community members participated in the workshops, including emergency management personnel from both combat agencies and supporting services. It is worth noting that this group remained committed and motivated to attend the workshops as well as continued to invite other community members to join in. Perhaps the motivation to contribute to preparing the Action Plan is the result of the uniqueness of this community given its past, but also relatively recent, experience in confronting natural hazards. This experience is often seen as a contributor to social memory which helps people to be better prepared for future hazards as well as to deal with change and uncertainty related to hazards (Berkes, 2007). The inclusion of specific policies related to floods and bushfires indicates that there is considerable local knowledge of how these hazards can impact the community (social memory). In particular, while community members extensively identified bushfires as being a key threat to the area, the fact that a major flood event occurred during the course of preparing the Action Plan highlighted the need for it to also be explicitly considered by proposed policies. Additionally, future impacts from climate change such as sea level rise and change in the frequency and intensity of natural hazards also underpinned some of the proposed policies related to disaster management and town planning.

Other aspects that probably facilitated continual engagement in the process of preparing the Action Plan was the existence of leadership within the community – an attribute identified in the literature (Gibbon et al., 2002; Laverack, 2001)-, and participants' acknowledgement of the importance of having a plan to improve the District's capacity to deal with future hazards. The second aspect in particular brought a sense of cohesiveness to the group as it sets itself the task of preparing the Action Plan for improving their community. It was this leadership and cohesiveness that enabled a wide breadth of policies to be included in the Action Plan as opposed to being driven by self-interested parties. Nonetheless, the preparation of the Action Plan is just the beginning and the extent to which it meets aspirations from all sectors of the community is still being confirmed through a formal consultation process, which is giving all community members another opportunity to contribute to the Plan.

#### **4. Conclusion**

This paper described a bottom-up collaborative planning process aimed at developing a long term strategic Action Plan for the Sussex Inlet and District community to strengthen its capacity to deal with future natural hazards, including flooding. The Action Plan pays attention not only to disaster response capacity but also takes into consideration the complex and lengthy process of disaster recovery, particularly from a social perspective. The process of developing the Action Plan is grounded on two emerging concepts attempting to address current and future natural hazards: betterment and post-disaster planning in the pre-disaster phase.

From a betterment perspective, the Action Plan takes into consideration the need for improved urban planning practices, greater social equity and economic development based on the strength of local industries, thus beyond the typical approach to disaster recovery focused on reconstruction of physical structures (Kates et al., 2006). From a post-disaster planning in the pre-disaster phase perspective, the Action Plan acknowledges the need for actions to be taken before disaster strikes to ensure the community is better prepared to deal with complex decisions and time constraints which are typical in the aftermath of disasters (Meyer et al., 2010). Both approaches are yet to be tested in practice and may need many barriers to be overcome to be fully implemented by traditional disaster governance regimes (Serrao-Neumann et al., 2015).

With respect to engaging communities in collaborative planning initiatives, there are some lessons worth extracting from this experience which can inform future initiatives. Firstly, it is important to engage the community from the onset of the initiative to ensure they acquire ownership of the collaborative process and understand that participation is welcome from all sectors of the community. Secondly, the group responsible for the engagement needs to be prepared to spend as much time as possible in the community to liaise with people and acquire a sound understanding of the problems they face. Thirdly, it requires dedication and commitment from engaged participants as well as strong leadership to drive and keep the process alive. Fourthly, it requires efforts from all parts, engagers and engaged participants, to involve more people as the collaboration progresses to ensure representation of different interests and values are brought to the process. Finally, preparing the Action Plan is just the beginning and the ties and networks created during the collaborative process need to continue, and be strengthened, during the Plan's implementation phase.

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