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COMMUNITY INVOLVEMENT IN COASTAL HAZARD MITIGATION: SOME INSIGHTS INTO PROCESS AND PITFALLS

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ABSTRACT

Resource management authorities are challenged with managing both the numerous hazards associated with the coastal environment and the people that live work and play in these places. A task which has become more difficult as the coastline is increasingly populated and land values raise, primarily because of the greater risk and vulnerability of homes and infra-structure to natural process. When an event, like coastal erosion occurs, conflict over how to solve the problems are inevitable as a wide range of values and interests clash. This paper examines the role that community groups can play in mitigating coastal hazards, the key factors that lead to groups achieving their goals and the influence that groups have on mitigation policy. Six case studies were investigated with a focus on actual local outcomes, relationships between key stakeholder, especially the community, local government and technical specialists. Although each study is different, some interesting parallels can be drawn about key elements of process, pitfalls and barriers to achieving protection of the natural character of the coastal environment (under section 6 of the Resource Management Act 1991) and maintaining wider community interests. A conceptual model is used to link these and provide a framework for discussion. Of particular importance is the role of power, value of relationship building, resource availability, local authority alignment, and the necessity of good scientific input

1 INTRODUCTION

The New Zealand coastline presents numerous challenges to resource mangers because of its dynamic nature, diverse geomorphology and oceanography and its popularity as a place to live and spend leisure time. Its one of the longest (ranked 7th in the world at 18,200 km long, including estuaries), and most diverse of any country in the world (Rouse *et al.*, 2003). Natural processes deliver the full range of physical hazards including beach, dune, and bluff erosion; slides, slumps, and gradual weathering of sea cliffs; and flooding of low-lying areas during major storms. These hazards pose or are perceived to pose, a risk to things that humans value. The dynamic environment coupled with increasing coastal development and escalating coastal property values is leading to considerable conflict over what should be done about coastal hazards and in particular coastal erosion.

1.1 A Community perspective

Since World War II, there has been a trend towards coastal living with a significant proportion of New Zealanders now living near the coast (Rouse et al., 2003) Unfortunately, many early subdivisions did not take account of naturally fluctuating shorelines and associated hazards, nor the potential impacts on shoreline stability of dams on rivers, aggregates extraction, engineering structures and climate change. As a consequence many coastal communities have homes and infrastructure which are affected or threatened by erosion or inundation because they are simply too close to the sea. More importantly, as coastal property values have increased the ‘traditional Kiwi beachfront bach’ has become more of a mansion representing a significant capital investment and raising the level of risk. Councils now face greater pressure from increasingly more influential and powerful beachfront property owners to protect their investment through engineering works.

It is interesting to note that a national survey of coastal communities in 2003, showed that respondents perceived coastal erosion to be the mostly likely hazard to affect their communities (Johnston *et al.*, 2003). Of these respondents, 55% believed that either a seawall or large rocks were the most appropriate means to mitigate coastal erosion, while 12% selected beach re-nourishment, 12% preferred the do nothing option and very few owners elected to move their houses back (i.e., managed retreat). This supports practitioners observations i.e., a strong call from affected communities, led by beachfront property owners, for Council to undertake engineering protection works to ‘hold the line” (Blackett & Hume, 2006). The desire for seawalls is probably linked to a desire to protect personal property and reduce the loss of the popular public land between the beach and private or commercial property. To complicate matters further, insurance in erosion or flood prone areas (Saunders, 1998) is becoming more difficult and expensive to obtain. However, there are some considerable disadvantages with seawalls, which are often forgotten, in particular, funding the capital cost and maintenance cost, the reduction of the natural character of the coast, and loss of a high tide beach.

1.2 Role of community groups in erosion mitigation

Community groups are paying an increasing role in coastal erosion mitigation as a result of a greater focus by policy agencies on community participation, inclusion and consultation and more emphasis on voluntary environmental actions. For the purposes of this paper community groups refers to those initiated by local authorities for a specific function as well as those formed independently within the community for either a lobby or action oriented reason. From a theoretical perspective involvement of community groups in decision making is thought to lead to improved quality of decisions and overall environmental results, build community relationships, increase local capacity to understand and manage environmental issues (Beierle & Konisky, 2001). Moreover, it may be effective in reducing public disillusionment with local government (Burgess *et al.*, 1998). There is a strong focus on negotiation of shared environmental values leading to some sort of local action (McGuirk, 2001; Owens, 2000), preferably as a partnership between communities and local government (Burgess et al., 1998).

1.3 The scientific and legislative backdrop

Coastal management worldwide has seen a paradigm shift away from the ‘humans against nature approach’ towards a more integrated ecosystems approach (Kay & Alder, 2005). This has been driven by the potential for aggravation of coastal erosion and flooding by projected climate change, adverse affects of engineering structures, increased emphasis on sustainability, and concerns about the resilience of coastal settlements. The approach involves using ‘soft engineering’ (i.e., beach renourishment or dune restoration or offshore reefs) and managing humans rather than beaches. Moreover, it recognises that a failure to manage the human dimension of coastal hazards typically results in problems becoming more complicated over time. This is reflected, to some extent, in The Resource Management Act (1991) where section 6 requires anyone

exercising powers under the Act to ‘recognise’ and ’provide for’ the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development (s6(a)).

Under the RMA, the Minister of Conservation is required to produce a National Coastal Policy Statement (NCPS) to provide Local Authorities with some degree of national direction over coastal management issues (Rouse et al., 2003). The 1994 statement outlines a number of policies which the Minister considered relevant to achieving the purposes and principles of the act, including issues of maintaining natural character, subdivisions, coastal hazards, maintenance and enhancement of public assess (Department of Conservation, 1994). Specific reference is made to the susceptibility of the coastal environment to natural hazards and a precautionary approach is promoted due to knowledge gaps over coastal process. Moreover, it requires plans and policies at the Regional and District level to recognise and provide for the mitigation or avoidance of the effects of natural hazards through enhancing and preserving natural feature that could offset effects (i.e., dunes, mangroves, wetlands), recognising potential inland migration of natural features as a result of natural processes and use the best practicable option when existing properties are threatened by hazards, including doing nothing (Department of Conservation, 1994). However, Local Authorities are also required to act in accordance with the Local Government Act (2002) which places a strong emphasis on community involvement in decision making. This act is relevant because it allows coastal communities to create visions for the future, through the community outcome process, which means the Long Term Council Community Plan (LTCCP) process has had to deal with coastal hazards.

At the end of the day, individual local authorities are still left to grapple with exactly how to balance environment, social, economic and cultural issues in the coastal environment under a climate of increasing pressure to permit the development of potentially hazardous coastal land. New subdivisions are considerably easier because appropriate set back zones can be enforced and although there may be disagreement between the technical experts over the size of the setback there is agreement on the importance of such buffers. Its more difficult and challenging when an existing group of homes or infrastructure are under threat. Rosier (2004) identifies the need for the NCPS to take a greater lead in addressing coastal hazard management to assist local authorities deal with the pressures on the coastal environment.

This paper reports on insights into the role that community groups can play in mitigating coastal erosion, the key factors which drive outcomes, and the influence the groups have on mitigation policy. It is part of a collaborative research between GNS Science, NIWA, and AgResearch on community participation in coastal hazard mitigation. The Research was conducted using open unstructured interviews with key informants within the community, local authorities and technical specialists. Interviewees were selected based upon the authors’ networks and to represent a range of views and ideas on the six selected case studies. All interviews were tape recorded and transcribed. The case studies are Urenui, Muriwai, Mokau, Marocopa, Bay of Plenty Coast Care Groups and Mangawhai.

2 RESULTS AND DISCUSSION

2.1 CASE STUDY SUMMARIES

The case studies were selected to represent a range of challenges faced by local authorities in order to gain some broad understanding of key factors which drive outcomes. At this point it is pertinent to explain the description of ‘positive’ and ‘negative’ environmental outcomes. Positive environmental outcome are defined as those

which meet the requirements of the RMA section 6 ‘retain natural character’ because this phrase is echoed through planning documents nationwide. To this end, we have classified situations where ‘soft’ options like dune re-vegetation or managed retreat as ‘positive environmental outcomes’ because they do not impact on natural character, are not contrary to many district plans and do not reduce the amenity value of the area for the wider community. Negative environmental outcomes may be options based around shoreline armouring (or some other hard engineering option) which although may succeed in stopping the shoreline from retreating further, will generally lead to a loss of high tide beach and natural character of the area. The authors recognise the value judgement inherent in this definition but feel it is necessary and is not out of step with current thinking and changing paradigms in coastal management.

2.1.1 URENUI

At Urenui, (Figure 1) coastal erosion threatened the only par 5 hole on a popular golf course. A powerful lobby group put pressure on the District Council to armour the shoreline to protect their interests. The District Council employed a consultant to facilitate community consultation and gain agreement on an outcome. In the consultants view, the best outcome was a managed retreat with a relocation and reshaping of the par 5 hole to retain its level of difficulty. However, the lobby group withdrew from the process and used political pressure to begin a consent application (to the Regional Council) for a publicly funded seawall in spite of wider community interest in maintaining the natural character of the shoreline and a high tide beach. In the end a consent was granted and a $800,000 seawall constructed. This is considered a negative environmental outcome because the natural character of the beach was lost and the end result suited the lobby group.

2.1.2 MURIWAI

At Muriwai (Figure 1), solutions were being sought to combat coastal erosion that threatened ARC Regional Park infrastructure including car parks, surf club, surf towers, roads, and also the golf course. The most influential stakeholders and the wider community both wanted to retain the natural character of the beach – quite a different situation to Urenui. The communities’ initial suspicion of the Regional Council was overcome through a robust participatory process and a managed retreat strategy of park infrastructure was negotiated. An approach of adaptive management has been implemented where facilities are moved back progressively to accommodate the erosion. This plan is active as the surf club has recently been moved. This is considered a positive environmental outcome.

2.1.3 MOKAU

Coastal properties on the sand spit at the mouth of the Mokau River (Figure 1) have been threatened by cycles of erosion since the 1950’s. Over the past decade the Regional and District Council undertook community consultation to determine what could be done. Initial pressure from beachfront land owners was to build a seawall to protect their investment, however, both the wider community and the Councils opposed this option because of the costs (covered through additional local rates) and loss of natural character of the beach respectively. Some front land owners became reconciled to ‘doing nothing’ once the nature of the hazard was explained by technical experts and they realised they may get many more years use from their properties despite the threat. Other owners have resorted to sand bagging and dumping rocks at the toe of the dune to ‘hold the line’. Mokau is interesting as this is the second time the Regional Council has been though this cycle because once the beach appears recovered, beach front properties are usually sold on. As a result, with each erosion event, the Council must deal with new land owners who are not necessarily aware of historical decisions and the history of erosion events. Each resale adds approximately $100,000 to the property

values and could potentially lower willingness to ‘do nothing’ in the long term. This situation occurs in spite of information on the land title stating the erosion prone nature of the environment and its classification as a high risk zone.

2.1.4 MAROCOPA

Sand dunes on the spit at Marocopa (Figure 1) had been gradually eroding mainly due to human disturbance of stabilising vegetation on the sand dunes by grazing cattle and off road vehicle traffic. Erosion was beginning to endanger the resting place of Tupuna from ancient battles and could, over time, have allowed wave overwash of the spit and made the properties on the east bank of the river vulnerable to attack from the sea. The dune restoration began with the concerted efforts of one local person who began by warning people off the spit and approached Central Government (to whom land management responsibilities fell through an old agreement with local hapu) for assistance. Central Government then involved the Regional Council who provided advice and assistance to begin the re-vegetation. More traction was achieved when the local person understood more about resource management matters. As the project proceeded the wider community became more accepting and supportive of the dune restoration plantings0.

2.1.5 BAY OF PLENTY COAST CARE GROUPS

Coast Care groups may start for many reasons but are driven by a threat to either property, public infrastructure (e.g., surf club, reserves or beach access) or a valued resource (e.g., beach or coastal plant species). Their activities involve revegetation and fencing off of dune areas to build up the sand in the dunes and provide a buffer against coastal erosion. The key players in the process are the groups themselves and Local Authorities through the provision of advice and resources. Successful groups are those that adopt ownership of their activities and develop successful partnership with Councils.

2.1.6 MANGAWHAI

During a severe storm in July 1978 the Mangawhai spit (Figure 1) was over topped and breached by the sea and a second (and southern) entrance created to the harbour. In the following years the original (northern) entrance gradually shallowed and finally closed off resulting in loss of a navigable waterway to the sea. There was also siltation in the mooring area in the harbour, eutrophication (stagnation) of the lagoon and wave attack on the inner (west) shore of the harbour via waves entering the new entrance. A community group formed to reopen the old entrance and close the new one, however, thier first attempt (‘The Big Dig’) was unconsented (under the RMA) and unsuccessful. After this first failure, the group took on technical advice (from a local coastal engineer) and after raising further public support succeeded in closing the breached entrance and opening the original entrance and restoring the waterway to its former state and function. Since that time the group have completed follow up work to stabilise the spit against further threat for the sea and gone on to address wider issues including developing a harbour management plan and campaign against sand extraction at the harbour entrance.

2.2 KEY THEMES

While each of the case studies is different, some commonalities emerge which help identify issues that may be important drivers of positive or negative environmental outcomes. The key drivers revolve around the relations between the community, regulators and technical experts as well as the interactions between these groups (Figure 2). Within the community there are two key players the stakeholders (or those directly affected) and the wider community, their goals may not necessarily align. The regulators consist of regional and district councils, while technical experts are a mix of scientists, practitioners and engineers. All parties are affected by outside media and political

influences. Key drivers towards positive or negative outcomes are related to relationship, power balance, resources, alignment of local authorities and the role of science. These are discussed from a standpoint which highlights areas of relevance for local authorities.

2.2.1 RELATIONSHIPS

Situations where co-operative relationships have developed seem much more likely to encourage positive environmental outcomes. Key elements are:

Effective communication
Many groups expressed confusion over planning and policy concepts and process which create stumbling blocks for early relationship building. One participant undertook specialist training in resource management to improve their ability to understand and communicate local authority process and terminology.

Support group learning
Positive outcomes seem more likely when a local authority (Mokau, Beach Care groups) or expert (Mangawhai and Muriwai) facilitates group learning. Action competence relates to the confidence a group has in its ability to undertake action, essentially, it is the skills and knowledge within the group from problem solving and past activities (Margerum, 2002: Fien & Skoien, 2002) which can be applied to the problem at hand. Jensen (2002) believes four key elements are necessary for effective action; knowledge about effects, root causes, strategies for change and alternatives and visions. To build action competence a group must come to terms with the complex environmental, social, economic, cultural and political contexts of the problem. In order to do this they will need to have access to a wide range of resources including, funding, technical knowledge and support, practical assistance and inspiration (Walton, 2003). Local authorities and technical experts have a key role to play in this area in order to achieve successful outcomes.

Transparent process and building trust
This includes honesty around the limits imposed by policy and plans, timeframes, funding possibilities and managing exceptions over solutions. Consultation and discussion between stakeholders and local authorities appear to be a very important part of positive environmental outcomes. However, councils do need to be prepared to be unpopular to begin with and focus on slowly building trust.

Address with the appropriate urgency
If a problem is left to fester, community lobby groups (i.e., Urenui) seem more likely to appear and it increases the chance of potentially inappropriate individual or community action (Mangawhai). Moreover, communities perceive coastal erosion risks differently to those with technical knowledge and are often convinced their land is at immediate risk of falling into the sea (West, 2005). This is usually not the case, but the perceived risk is the one which must be addressed.

2.2.2 IMPORTANCE OF POWER

Issues of power are important both within groups and between organisations. Any Local Authority needs to be well aware of the influence power has on the way groups behave and the implications for the planning process. Forester (1989) suggests that to ignore this dimension of social interaction undermines the benefits of participatory processes and distorts planning outcomes. Beach front landowners lobby groups are usually particularly loud and organised and dealing with these groups effectively requires recognising and dealing with power issues. At Urenui there were probably two key things which lead to the construction of a seawall, first is the power of the local lobby group and its political connections, second, is the Regional Councils lack of action to protect the

natural character of the beach. The desire to protect ones property is quite understandable, but is this appropriate at the expense of the amenity value of the wider community? Power and resources of lobby groups should never be underestimated and claims to represent interests of the wider community may be overstated. This problem is set to become more evident and more challenging for local authorities to manage as the value of coastal properties rises.

2.2.3 RESOURCES

The supply of resources to a group is important and Ritchie, (1998) believes many community groups, particularly care groups, are constricted by their access to finances to undertake negotiated actions. Most Local Authorities support Coast Care through direct funding via competitive proposals or in the form of providing technical advice on planting and plants for dune restoration projects and education on coastal processes. Either way progress may be constrained by finances.

However, groups with their own financing and limited access to appropriate knowledge pose another set of problems, because they have the ability to act independently (i.e., Mangawhai). If these groups do not have appropriate technical guidance they may not be effective in their chosen action.

2.2.4 ALIGHMENT OF LOCAL AUTHORITY PLANS AND POLICIES

This is an interesting area because although the NCPS was intended to inform Regional and District policy, just how aligned they are at a practical operational level is unclear. If local authority goals are not aligned with respect to coastal hazards then environmental management may be to some degree inconsistent between regional and district authorities as well as across the country. Moreover, there is plenty of room for inter-agency conflict over particular issues and exploitation by powerful stakeholders groups .

2.2.5 THE ROLE OF GOOD SCIENCE

The role of science in community groups is interesting because scientific information on its own may not inspire action, but without information any action may be ineffective. In other words, science is a necessary part of the process but must be introduced at the right time for the group to establish what it can realistically achieve. Science can help groups understand what they can expect to achieve, what the consequences could be, how they potentially achieve it and how long it may work for (i.e., Mangawhai). Management of this process is generally undertaken by a technical specialist either within Local Authorities or as external contractors. If technical information is ignored by a group, or filtered to suit their purpose, a ‘poor’ environmental outcome is more likely.

A constant challenge in the coastal environment is to interpret risk and provide the best possible scenario for actual threats. In other words, rationalisation of the communities perceived risk with the actual risk to reduce knee jerk reaction and seawall construction. Technical experts may be able to demonstrate that the erosion is part of a short-term trend (months and years) of cyclic shoreline advance and retreat and that the issue will ‘cure itself’ without the need for engineering intervention. In other cases, the risk may have a considerably longer timeframe and the property may be useable for several more decades.

2.3 SOME INTERESTING CHALLENGES

Local authorities face some interesting challenges over coastal management, in particular, the retention of institutional and community knowledge and tackling local politics.

Institutional and community knowledge is important in cases like Mokau where the cyclic nature of erosion means the problem is continually revisited and renegotiated. Turnover of staff in Local Authorities and a failure to record events and knowledge makes each new incarnation more difficult as property prices increase.

Local politics and pressures may be more difficult for some councils particularly those with close links to their rating base.

2.4 THE ROLE OF COMMUNITY GROUPS IN EROSION MITIGATION

Involvement of community groups in coastal erosion management in New Zealand occurs through Coast Care groups, action oriented local groups (i.e., Mangawhai), and lobby groups. At the Policy level, contributions are made through participation in deriving community outcomes as part of the Long Term Council Community Plan under the LGA (2002) and submissions to plans and policies prepared under the RMA (1991).

A link between work at the practical level and involvement at the policy level does not appear to exist for the groups involved in this study. Their focus appears to be considerably more local and in response to a particular perceived threat.

It is hard to know if this balance is right because from the current political perspective greater community participation and involvement is desirable. However, given the perceived risks, complexity of coastal processes and powerful vested interests in the coastal area is it really wise to pursue a policy goal of a more participatory process? Could greater participation mean many of New Zealand's beach settlements end up with a seawall, reduced natural character and no high tide beach? A combination of community action facilitated (or assisted) by Local Authorities within the framework of the RMA and LGA still appears to be a more sensible option to ensure all interests are protected and rights secured.

3 CONCLUSIONS

Where communities are involved in coastal hazard mitigation, positive or negative environmental outcomes are dependant on the relations between the community regulators and technical experts and the way those groups interact. Positive outcomes are encouraged when:

- Cooperative relationships are developed
- Local Authorities facilitate group learning
- Communities have access to resources such as funding, technical knowledge and assistance and inspiration
- Time is taken by the Local Authority to build trust
- Perceived (as well as actual) risks are addressed
- Claims by lobby groups to represent the wider community are tested
- Scientific information is introduced at the right time and in understandable language
- Good records of the physical situation and past attempts to resolve the solution can be used to minimise the time spent revisiting the situation with new owners.

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Figure 2: Conceptual model of the interactions between various groups involved in coastal management in New Zealand.

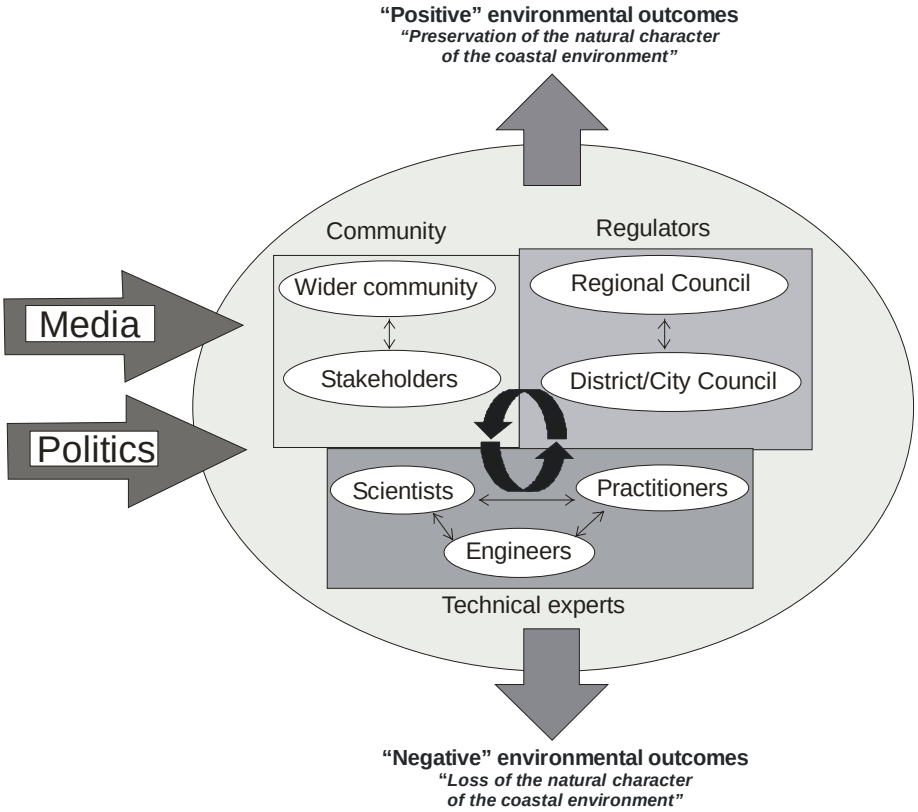

Figure 1: Location of the six case studies