

Coastal adaptation planning in Fairbourne, Wales: lessons for climate change adaptation.

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Abstract

Adaptation to climate change is emerging as a central objective and policy frame for coastal communities. This paper examines recent climate change adaptation efforts in the UK, centring on the case of Fairbourne, Wales. The village is facing the long-term prospect of flooding and inundation due to the impacts of sea level rise. The recent Shoreline Management Plan for the area has recommended realignment of the coast and eventual decommissioning of Fairbourne. The paper draws on a qualitative research methodology of interviews, policy review and observation to narrate the case and provide key insights and lessons for planners working in environmentally vulnerable coastal settings and managing climate adaptation processes.

Key Words

Fairbourne;
Shoreline Management Plan;
Coast;
Managed Realignment;
Climate Change Adaptation

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1. Introduction

Climate change presents substantial risks to global populations and ecosystems (Carter et al., 2015; Vogel and Henstra, 2015). For example, warmer temperatures are expected to contribute to an increase in the frequency and intensity of extreme weather and climate events such as heat waves, droughts and tropical storms (IPCC, 2012). Within coastal areas, climate change will likely exacerbate flood risk and coastal erosion through sea-level rise, more frequent and severe storms, and increased precipitation (OST, 2004; Few et al., 2007a; de la Vega-Leinert and Nicholls, 2008; Susskind, 2010). The coast is a particularly important area of study as approximately 40% of the global population lives within 100 kilometres of shorelines (UN, 2017) with many of the world's largest cities located in low-lying floodplain areas (Brown et al., 2013). The severity of damage in these areas from extreme climate events will, in large part, reflect levels of exposure, vulnerability and the ways in which risks can be mitigated through disaster management, resilience and adaptation strategies (IPCC, 2012).

While mitigation remains crucial to addressing global warming, recognition that changes to the climate are already affecting natural ecosystems and human populations has led to an increase in policies and practices associated with risk management and adaptation (Aguiar et al., 2018). The Intergovernmental Panel on Climate Change defines adaptation as ‘...the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities’ (IPCC, 2012, 5). In the context of the coast, adaptation might include policies and practices that disallow development in flood prone areas, the establishment of building standards and codes to improve flood resilience (e.g. requirements to elevate structures as well as construction materials that are resistant to flood damage), or flood watch and emergency evacuation plans and disaster relief protocols for potentially impacted areas (among other activities). While adaptation can generate benefits such as reduced risk and vulnerability, these actions may also generate costs (e.g., the displacement of marginalised communities). These unintended consequences are sometimes referred to as maladaptation – situations where risks and vulnerabilities are worsened as a direct result of adaptation strategies and processes (Magnan et al., 2016).

Spatial planning¹ plays a crucial role in place-based climate adaptation (Wilson and Piper, 2010, Hurlimann and March, 2012; Wilson, 2006; Mathews, 2013). Hurlimann and March (2012, 480) draw attention to six key ‘capacities of spatial planning’ which, they argue, can facilitate climate change adaptation. Among these include planners’ concern for matters of public good or interest, their ability to manage conflict across various scales and sectors, the field’s orientation towards the future and its potential to facilitate collaborative solutions to complex spatial challenges (Healey, 1997). However, Carter et al., (2015) note that planning decisions often do not adequately incorporate climate change risks and at times can be seen to increase vulnerability, for example, by allowing development in flood plain areas. Furthermore, power, resource and capacity imbalances may limit the ability of disadvantaged individuals and communities to adapt to climate change, thereby exacerbating inequalities (Vogel and Henstra, 2015).

Yet, the role of spatial planning as a tool for climate change adaptation is under-researched (Hurlimann and March, 2012). Vogel and Henstra (2015, 110) suggest that current knowledge of the ‘scope and substance of adaptation strategies... as well as the processes and procedures by which policies are developed and implemented’ is inadequate. Others note there is ‘very little evidence about how [local] adaptation actually happens’ (Hurliman et al., 2014, 85). The aim of this paper is to respond to this gap and contribute to knowledge regarding the role of planning for climate change adaptation at the local level. More specifically, it analyses the conflicts between communities and local and national planners in coastal adaptation planning as a means to advance understanding of how to deliver challenging coastal adaptation policy.

This paper examines recent coastal planning activities in Fairbourne, Wales where climate change adaptation has become a central coordinating theme and contested basis for managing the shore. Fairbourne is a village of approximately 600 households which has begun planning for withdrawal from the coastal area due to concerns related to climate change and sea level rise. Of primary concern here is to draw on the experience of Fairbourne as a means to consider the local, place-based

¹ Following Wilson and Piper (2010, 10) spatial planning is defined as ‘the ability to plan, in a democratically accountable way, the activities of economic and service sectors ... that have spatial or land-use consequences in their wider social and environmental context ...’.

processes and potential implications associated with planned climate change adaptation along the coast.

The paper structure is as follows: following this introduction, the article details the research methods before it turns to the key UK policies and programmes associated with adaptation to climate change along the coast. Subsequently, the case study of Fairbourne is presented in order to consider process and delivery challenges. Before concluding, the discussion section highlights a few key points and implications from the Fairbourne case that hold relevance for coastal planners and those involved with climate adaptation.

2. Methods

This paper presents a case study of coastal adaptation planning in Fairbourne, Wales. A case study is a commonly used procedure and research strategy for social analysis in situations where context is crucial to the understanding of a particular phenomenon (Yin, 2014). The rationale for using a case study approach in this research is based on a desire to highlight the unique and relatively unusual processes of coastal adaptation associated with Fairbourne. The case was chosen purposefully for its distinctiveness as one of the largest residential areas in the UK to begin planning for climate adaptation through ‘decommissioning’² of the village and eventual resettlement. While this uniqueness might suggest a limited potential for generalisation, the case study is intended to provide insights into the particular challenges of coastal adaptation planning processes which may emerge over the next several years due to climate change and sea level rise. Yin (2014, 52) explains how extreme or unusual cases that deviate from ‘theoretical norms or even everyday occurrences’ can be an appropriate form of knowledge development. Further, according to Platt, single and unique case studies may be ... useful to ‘demonstrate the existence of a phenomenon which needs to be taken into account’ (1988, 17). This is the critical potential of the Fairbourne case as the environmental challenges facing the village (particularly with respect to sea level rise and coastal erosion) are likely to be repeated elsewhere in the UK and internationally (Committee on Climate Change, 2018). By detailing the experiences and conflicts of the Fairbourne case, it is hoped that the paper will

² The word ‘decommissioning’ is used by Gwynedd Council to mean removal of the village and is identified as central to the process implementing the recommendations of the Shoreline Management Plan (FMF, 2017)

contribute to our understanding of how to deliver challenging coastal adaptation policy in the future.

The case study was developed through a mixed-methods approach. Data sources examined and analysed for this paper are discussed below and include grey literature, media accounts; field visits and observations of stakeholder engagement; and interviews.

Grey literature: the paper draws on a review of key sources of policy guidance and review for coastal planning in England and Wales (n = 22). Documents were examined from 2005 onwards and included: two Shoreline Management Plans (SMPs) for the West of Wales; coastal and flooding policy guidance and review from Defra (2005; 2006a; 2006b; 2011; 2012; 2018), the Environment Agency (2011; 2015), Gwynedd Council (1998; N.D; 2017; FMF, 2017), The National Trust (2015); Natural Resources Wales (2014a; 2014b; 2016; 2017), the Office of Science and Technology (2004); Pembrokeshire County Council (2011a; 2011b; 2012; 2015), and the Wales Audit Office (2016).

In addition to government documents, policies and reports, the paper draws on community newsletters (n = 14) from Fairbourne Facing Change (FFC), a local stakeholder group which has engaged and challenged the coastal planning policies for Fairbourne over the last several years. These newsletters help identify how planning for climate adaptation has been framed and understood by this resident-led stakeholder group. It further contributes to understandings of the conflicts which have emerged following establishment of the decommissioning policy.

All grey literature was reviewed through a process of skimming, targeted reading and interpretation (Bowen, 2009). Many of these sources were examined only to provide to better understand the issues and conditions emerging in Fairbourne and to guide interview questions. Other documents were more critical in understanding how specific concepts (e.g., climate change) were infiltrating policy and guidance.

Media accounts: Media accounts (n = 15) were included to understand how the issues and controversies associated with Fairbourne's coastal adaptation processes and

policies were being framed. A search was conducted for online news reports published between 2010-2018 which included the key words 'Fairbourne' and 'coast'. However, a few additional media sources were included (e.g., BBC, 2014a; 2014b) as they were repeatedly mentioned by interviewees who indicated they were critical in drawing attention to Fairbourne's shoreline management programme.

Site visits and observations: Document, policy and media information was supplemented by three site visits to Fairbourne (between October 2016 and March 2018). Each field visit involved observation activities during which time photographs and field notes were generated to document the local context and physical environment (e.g., vacant houses, for sale signs, signs of flooding; coastal protection infrastructure, use of the beach, general physical condition of the village). Further data was generated through participation at a council-led workshop held in Fairbourne (9/3/18). The event was attended by representatives from Gwynedd Council, Natural Resources Wales, Network Rail, FFC, and other coastal stakeholders. During this workshop, two researchers took notes and were involved in small group discussions. Participation in these discussions contributed to the author's understanding of the local context (including key stakeholders) as well as the conflicts and challenges associated with Fairbourne's coastal adaptation programme.

Interviews: Finally, interviews with five individuals were conducted as part of this research. The interviews were intended to support the textual and field analysis and provide a further understanding of the shoreline management process. Interviews focused on those directly involved in these process. As such, two semi-structured interviews were conducted with the project manager for Gwynedd Council currently leading on implementation (2/11/17; 9/3/18) and two with the lead engineer involved in development of the SMP (2/11/17; 17/3/19). These individuals have been working in Fairbourne for several years and are both intimately aware with the coastal challenges facing the area. The engineer is also the individual who led the public engagement activities for the SMP in Fairbourne. Additional semi-structured interviews were held with a FFC representative (9/3/18 and 15/7/19) and two Fairbourne residents (9/3/18). These interviews were conducted during field visits and intended to contribute to further understand of the key issues and concerns in Fairbourne related to the coastal adaptation programme (for interviewee codes, please

see appendix). For all interviews, analytical categories and themes were developed after listening to the audio and reviewing notes. While it is recognised that the small number of interviewees is a limitation, the data gathered includes viewpoints and perspectives from centrally-involved stakeholders and is further supported by other data sources (detailed above).

3. Case Study and Analysis

The Fairbourne case is intended to contribute to understandings related to the challenges of coastal adaptation planning within the context of climate change and sea level rise. The first part summarises recent trends, policies and programmes related to coastal management in England and Wales. This is followed by a discussion of the most recent Shoreline Management Plan for the West of Wales, its application and relevance to Fairbourne and some of the notable conflicts which have emerged associated with coastal planning policies in the case area.

Coastal Planning in England and Wales

There are 12,400 km of coast in the UK, significant areas of which are under environmental stress (Pontee and Parsons, 2010). For example, of the 4,500 km of English coast, 1,800 km is said to be vulnerable to coastal erosion (EA, 2011). In Wales, it is estimated that over 2,000 properties could be at risk of coastal erosion over the next 100 years (Wales Audit Office, 2016). While flooding and coastal erosion have long been identified as critical issues facing the United Kingdom, major flooding events have increased awareness and stimulated the development of new policies (e.g., OST, 2004; Pitt, 2008; UK Government, 2010; EA, 2011; Defra, 2011). Most recently, the winter storms of 2013-2014 and 2015 brought added attention and media spotlight to flooding in England and Wales (BBC, 2014c; BBC, 2015; Dodds, 2014; Kendon and McCarthy, 2015; Sibley et al, 2015; NRW, 2014a; NRW, 2014b). Within the context of climate change, erosion and flooding due to rising sea-levels, severe storms and storm surges are expected to adversely impact infrastructure, communities and homes in coastal areas in the coming years (OST, 2004; EA, 2011; Wales Audit Office, 2016).

Currently, much of the UK coast is protected by hard engineering and defensive structures (Ballinger and Dodds, 2017; Thorne, 2014). Yet, as Ballinger and Dodds (2017) point out, defensive structures have, at times, contributed to worsening

flood scenarios by producing a false sense of security and/or facilitating development in vulnerable areas. Moreover, in recent years, national coastal planning guidance in the UK has shifted away from traditional models of ‘holding back the sea’ (e.g., protecting all existing coastal settlements, infrastructure and resources through defensive structures) towards flood risk management strategies (Defra, 2005; Johnson and Priest, 2008). As such, the conventional *hold the line* approach to coastal defence is slowly being supplemented by an integrated set of strategies which seek more *sustainable* coastal management based on strategic risk management processes and a stronger knowledge of natural coastal processes (Allmendinger et al 2002; Johnson and Priest, 2008; Pontee and Parsons, 2010).

There are coastal erosion challenges across the UK, with a notable cluster in the south and east of England (e.g. Norfolk) where particular geological conditions and coastal processes have led to erosion and coastal damage (Defra 2012; Famuditi et al., 2018). Several programmes have been introduced to manage coastal change. For example, the government’s £11 million Coastal Change Pathfinder supported fifteen individual projects through which to test adaptation approaches including education and awareness as well as more ambitious managed realignment and retreat of assets from vulnerable areas (Defra, 2012). Indeed, managed retreat, ‘the strategic relocation of structures or abandonment of land to manage natural hazard risk’ (Hino et al, 2017, p 364; Alexander et al, 2012) is emerging as a significant climate adaption option. As managers of approximately 775 miles of UK coast, the National Trust (a private charity) is also planning for climate change. The organisation’s *Shifting Shores* report (National Trust, 2015, 5) recognises that the defence of coastal areas is ‘increasingly less plausible’ and supports adaptation strategies that move structures and assets out of risk zones and allow natural coastal dynamics and processes to take place.

In Wales, the National Strategy for Flood and Coastal Erosion Risk Management widely’ (Welsh Government, 2011, 4-5) indicated that while traditional ‘drainage and defence’ solutions will remain critical to flood protection, other options are likely to be needed including ‘making more use of the natural environment, like wetlands or salt marshes’ and ‘deploying sustainable drainage systems much more. Under this national policy framework, it is likely that currently defended locations will be re-evaluated via strategic risk criteria. Such reviews may result in a shift away from the traditional practice of hold the line to policies promoting a realignment or

removal of coastal defences (Pontee and Parsons, 2010). One implication of this shift away from hard defensive structures is less certainty regarding the future shape of the UK shoreline. As Wendy Dodds (2017, 1-2) highlights, the National Strategy for Flood and Coastal Erosion Risk Management in Wales (Welsh Government, 2011) represents a shift towards ‘sustainable and innovative approaches’ to coastal erosion management that works ‘with natural processes rather than against them’.

Moreover, across the UK there is evidence of a move away from central or state-led models of flood risk management towards partnership and cross-sector collaboration (Johnson and Priest, 2008, 515; Butler and Pidgeon, 2011; Thaler and Priest, 2014). This has meant wider involvement of stakeholders such as the Wildfowl and Wetlands Trust, the National Trust, and Network Rail who own or manage property and assets along the coast, as well as local communities who are being encouraged to adapt their properties and livelihoods to flood risk. In Wales, the expectation is that flooding and coastal erosion risks are to be managed in a coordinated way across scales and sectors (Welsh Government, 2011).

Table 1: Roles and responsibilities for coastal flood erosion risk management in Wales.

<p>The Welsh Government Overall responsibility for coastal flooding and erosion in Wales</p>	
<p>Natural Resources Wales Strategic oversight of coastal flooding and erosion in Wales.</p>	<p>Risk Management Authorities Bodies with specific responsibilities for managing flood risk (Natural Resources Wales, 22 local councils and water companies)</p>
<p>Councils Operational responsibility for coastal erosion and flooding from surface water, groundwater and ordinary watercourses (watercourses that are not designated as a main river).</p>	<p>Water Companies Operational responsibility for ordinary watercourses, drainage and water level management.</p>
<p>Coastal Groups Voluntary groups made up of councils, Natural Resources Wales, the Welsh Government and other bodies with coastal responsibilities. Coastal groups are responsible for producing, implementing and monitoring progress with the Shoreline Management plans.</p>	
<p>Other Bodies Other bodies with a role in coastal risk management include infrastructure providers (e.g. Network Rail), landowners such as the National Trust, National Park Authorities (e.g., Snowdonia National Park) and other organisations with a stake in the changing coast.</p>	

Source: Wales Audit Office, 2016, 8

The shift of flood management responsibility as outlined in the Flood and Water Management Act (UK Government, 2010) and subsequent guidance such as the National Strategy for Flood and Coastal Erosion Risk Management in Wales (Welsh Government 2011), reflects an opportunity within which planners can play an important, positive, and unique role. This includes, for example, planners' ability to coordinate and manage decision-making processes amongst diverse stakeholders and competing interests both *vertically* (e.g., towards higher tiers of government and policy) and *horizontally* (e.g., across sectors and local departments) (Hurlimann and

March, 2012; Hurlimann et al., 2014). Some of the challenges associated with these forms of working are evident from the Fairbourne case, as will be discussed below.

Shoreline management planning: the West of Wales SMP

Within England and Wales, Shoreline Management Plans (SMPs) are the primary devices for conducting coastal risk management and for setting coastal policy. These are non-statutory long-term assessments of coastal conditions intended to help reduce the risks of coastal processes ‘to people and the developed, historic and natural environment’ (Defra, 2006a, 4). To date, there have been two rounds of SMPs. The first round was produced between 1996-1999 and provided policy recommendations for 50 years while the more recent second generation documents include guidance related to the coastline for 100 years over three ‘epochs’ (up to 2025; 2055; and 2100 respectively). Policy options fall into four areas: hold the line; advance the line; managed realignment; and no active intervention (Defra 2006a, 13-14).

Table 2: Generic shoreline policies for the SMP2

No Active Intervention (NAI)	Where there is no investment in coastal defence or operations.
Hold the Line (HTL)	By maintaining or changing the standard of protection. This policy should cover those situations where work or operations are carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on) to improve or maintain the standard of protection provided by the existing defence line.
Managed Realignment (MR)	By allowing the shoreline to move backwards or forwards, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).
Advance the Line (ATL)	By building new defences on the seaward side of the original defences. Using this policy should be limited to those policy units where significant land reclamation is considered.

Source: West of Wales Shoreline Management Plan (PCC, 2012, 1.7)

The production of SMPs falls to regional coastal groups³ who commission consultants to conduct research and assist with the technical aspects of coastal planning (Ballinger and Dodds, 2017). The plans are intended to ‘minimise the reliance on defence and increase the resilience of communities’ (PCC, 2012, 1.6). According to government guidance, following adoption of the SMP, local authorities are expected to develop implementation strategies and plans which can take policy recommendations forward (Defra, 2006a).

Adapting to Climate Change, Decommissioning Fairbourne

Fairbourne is a Welsh community of approximately 1,700 people in South Gwynedd at the mouth of the River Mawddach (see figures 1 and 2). The coastal area is surrounded by mountainous terrain and sits at the edge of the Snowdonia National Park. Fairbourne developed in the late 1800s as a holiday resort following the construction of a railway line (Gwynedd Council, 1998, 210). The village faces Cardigan Bay and is wholly within tidal flood zone 3⁴. The community comprises a mix of caravans and 1 and 2 storey detached homes and small businesses and is protected from the sea by a shingle beach and an embankment of concrete defensive structures.

³ Coastal groups are coalitions of local governments and other bodies. For the West of Wales this includes Pembrokeshire County Council; Gwynedd Council; Environment Agency Wales; Network Rail; the National Trust and others.

⁴ This means a 1 in 100 chance or greater of flooding from rivers and 1 in 200 chance or greater of flooding from the sea in any given year.

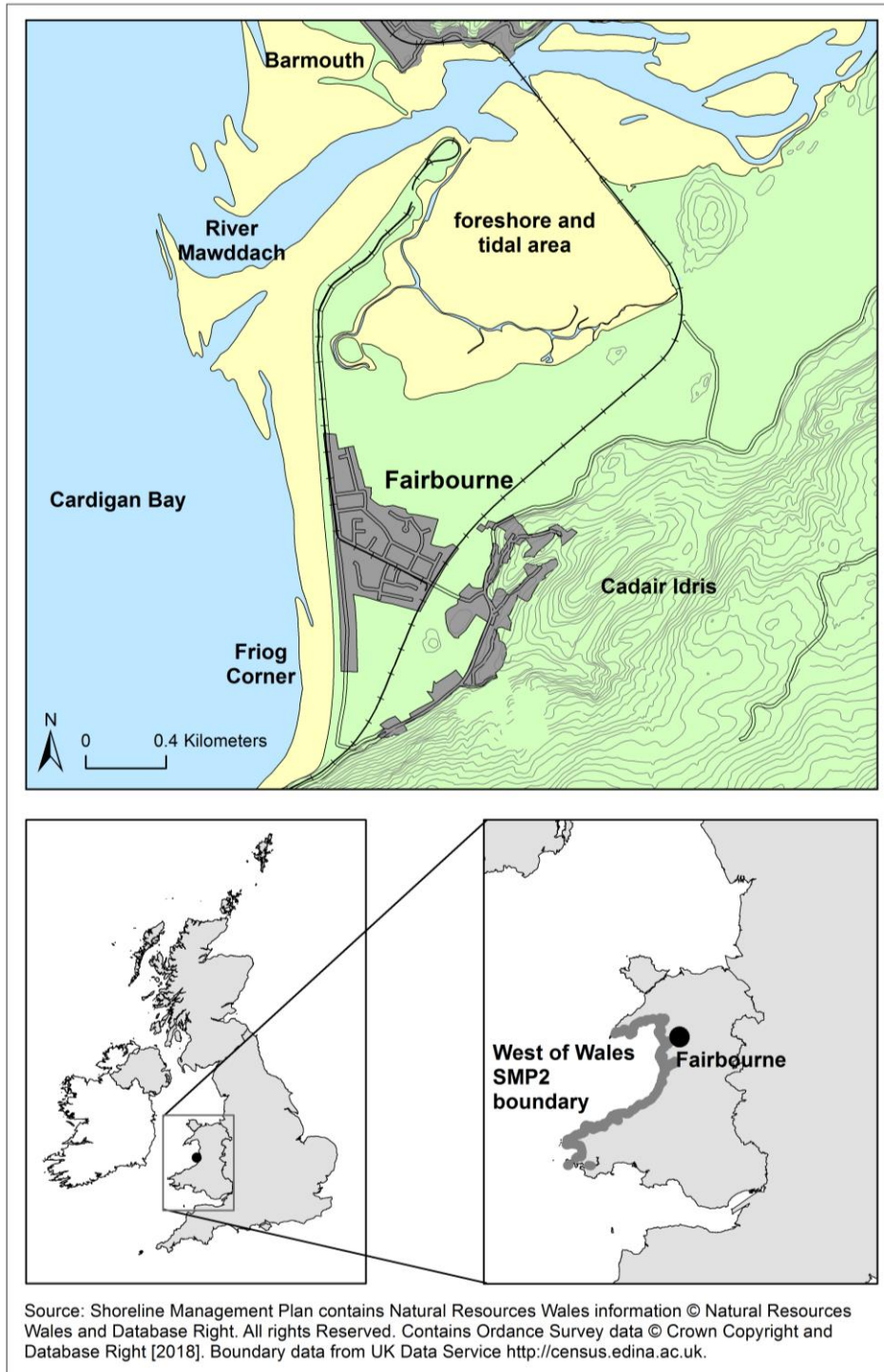


Figure 1: Fairbourne Location Map

The first shoreline plan for this area (SMP1) was completed in 2002 and recommended the policy of ‘hold the line’ for Fairbourne. The 2012 shoreline plan (SMP2) conducted further study of coastal processes (incorporating climate change scenarios) and includes analyses and policies across a 100-year timeframe (increased from 50 years). This reflects an ambitious future orientation and desire to match

planning to the long-term impacts of climate change impact (Wilson, 2006). The climate scenarios are based on an anticipated 0.36m SLR over the next 50 years, at which point, the plan notes that the village's defences (see figure 3) would be regularly overtopped and the entire area would flood on a 1:10 year basis (PCC, 2011a).



Figure 2: view of Fairbourne looking north (source: author)



Figure 3: Sea defences at Fairbourne (Source: Author). Policies based on the SMP2 propose to maintain this infrastructure for about 40 years after which point the coast will be realigned.

The village is situated in a particularly vulnerable position as it is threatened by coastal erosion and flooding from the sea as well as from the River Mawddach (See figures 1 and 2). Moreover, there are limited prospects for moving away from the coast via managed realignment as Fairbourne abuts steep slopes of the Cadair Idris ridge and Snowdonia National Park. According to the SMP2, without further defensive interventions, as a result of SLR associated with climate change, the village would be subject to regular tidal inundation and eventually would be lost to the sea. Based on an assessment of these scenarios and risks, the SMP2 recommended a shift away from the existing ‘hold the line’ policy from SMP1 across the three plan epochs (PCC, 2011a, 4D112):

- Epoch 1, up to 2025: Hold the Line (HTL)
- Epoch 2, up to 2055: Managed Realignment (MR)
- Epoch 3, up to 2105: No Active Intervention (NAI)

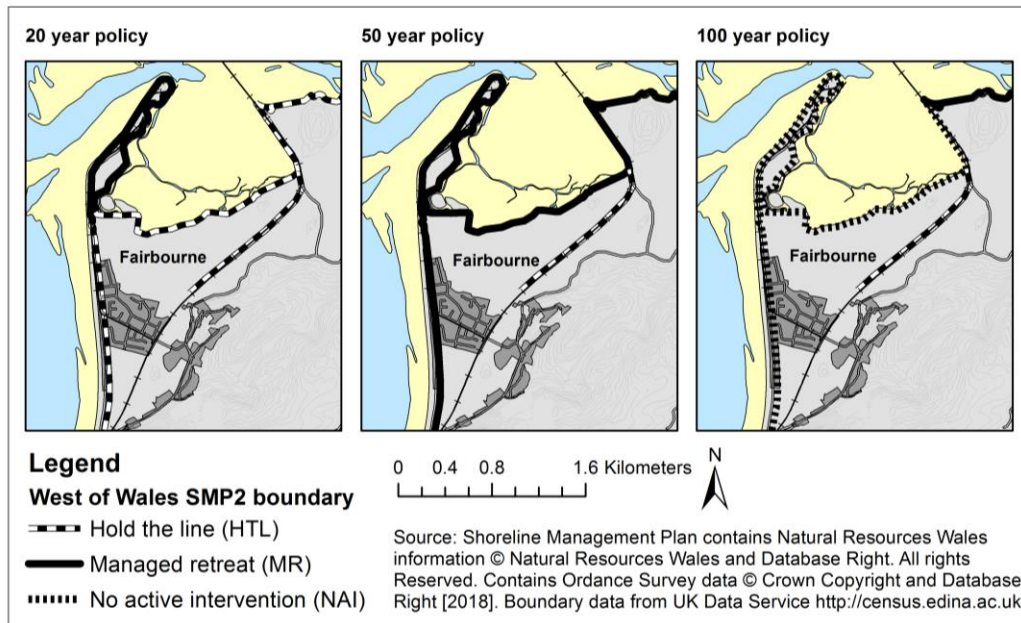


Figure 4: Map shows the transition of policies over the three epochs for policy units 11.4 (Ro Wen coast), 11.5 (Ro Wen Spit), and 11.6 (Fairbourne Embankment).

The implication of these policies is a commitment to maintain existing defences for a through epoch 2 followed by eventual decommissioning of the village and realignment of this area of coast. Adaptation to climate change, in this context, has meant a review and assessment of existing infrastructures based on future climate scenarios and the development of policies which seek to minimise risk, vulnerability and public cost.

Public response and conflicts associated with the SMP2

Adopted in 2012, the West of Wales SMP2 did not immediately result in significant public controversy in Fairbourne. In a written explanation following adoption, Gwynedd Council noted:

There was no written feedback from the local residents, although concerns were raised and discussed at the meeting. These views were incorporated within the Plan and the Plan highlighted the need for detailed discussion and planning. (Gwynedd Council, N.D., 5).

However, a 2014 BBC news report which highlighted the possible loss of coastal communities in Wales generated significant local and national attention. In interviews with the Gwynedd Council project manager for Fairbourne, this report was cited as

the impetus for local conflict⁵. Statements by the BBC (2014a; 2014b) suggested that Fairbourne was under immediate flooding threat and would be lost in 10 years. At the outset of the story, the television host asks the audience to:

...imagine discovering that in just over a decade your village, your whole community would be abandoned, left to the mercy of rising seas. The people of Fairbourne on the coast of west Wales have just found out this may be what lies in store (BBC, 2014a)

According to the project manager, the coverage and its dramatic portrayal of Fairbourne about to be ‘left to the elements’ and ‘lost to climate change’ (BBC, 2014a) contributed to anxiety and anger within Fairbourne which didn’t exist prior to the reports (interviewee 1, 2/11/17). This view was also expressed by Fairbourne resident and FFC (community stakeholder group) member who noted she was ‘surprised by the report’ (interviewee 3, 9/3/18) and was not aware of the SMP2 policies until she was interviewed by the BBC. The Gwynedd Council project manager specifically credited the BBC’s claim that the community would be lost in 10 years (see quote above) as inaccurate and inflammatory (interviewee 1, 2/11/17). In the months and years following the BBC broadcast the village has remained in focus through additional local and national news stories about coastal flooding. Much of this reporting has sensationalised the issue represented by headlines such as ‘Village of the Damned’ (Spillett, 2016) and ‘Welsh Villagers Trapped in “Zero Value” Homes’ (Sky News, 2016).

Nevertheless, journalism and news reporting has generated awareness and local involvement in shoreline planning and the large climate adaptation process. The Gwynedd Council project manager explained: ‘residents were completely unaware of the shoreline management plan until the BBC produced a Week In Week Out programme’ (interviewee 1, 2/11/17). Indeed, soon after the BBC report, a new community group – Fairbourne Facing Change (FFC) was established to:

...galvanise the community to actively challenge the inaccuracies of the reporting and coverage of the SMP2 and to focus on influencing the ‘direction of travel’ for the various policies within it. (FFC, 2014)

⁵ A discussion of BBC programme and other media accounts is essential as, according to local sources, there was no significant tension or conflict over the SMP2 until immediately following this coverage (interviewee 1, 2/11/17)

FFC resisted SMP2 policies and hired a barrister to mount a legal challenge (FFC, 2016a; 2016b). At issue were the baseline figures upon which SLR has been estimated in the SMP2. According to FFC newsletters, the assumption of 1 metre of SLR over 100 years was overly aggressive and a figure of 50 centimetres should have been used (FFC, 2016a; interviewee 3 9/3/18). The FFC resistance effort highlights the difficulty of long-term planning for climate change adaptation. It is perhaps not surprising that a group of local residents have challenged the policies that would allow for inundation of their homes and eventual abandonment of their village. However, from the context of adaptation, critical questions here relate to how these tensions and contestations might have been managed or brought to light at earlier stages of the SMP2. According to a FFC representative, ‘the engagement process during plan development was inadequate...’ (interviewee 3, 9/3/18). The interviewee went on to suggest that the single SMP2 meeting in Fairbourne was overly technical and did not provide opportunities for meaningful involvement. The limits of the engagement process were also noted by Gwynedd Council which explained that while ‘[M]any of the residents consider the consultation process to be inadequate’ (Gwynedd Council, n.d., 6) it was taking steps to improve communication and outreach within Fairbourne.

According to Few et al., (2007b), there is strong potential for local tension and resistance to adaptation to climate change, in part due to the time scales and uncertainty regarding climate change impacts. Within the literature, there is agreement that robust public participation and engagement strategies which facilitate ‘meaningful’ contributions from those affected by potential policy changes are needed in order to educate, motivate and empower local stakeholders (Few et al., 2007b; Wibeck, 2014). For the West of Wales SMP2, a range of committees and groups were established such as the Project Management Sub-Group; Elected Members Forum; and Key Stakeholder Groups with meetings held across the area between 2009 and 2011 including a meeting in Fairbourne on 20th of May 2011 attended by 20 residents (PCC, 2011b). While it had been expected that the local community council would conduct more extensive outreach to the public, apparently, this did not occur

(interviewee 1, 2/11/17) and no further community engagement efforts were pursued⁶. In a follow up interview, the engineer leading on development of the SMP2 agreed that in hindsight, more outreach could have been done earlier in the process for Fairbourne (interviewee 2, 17/03/19). The Fairbourne case suggests that existing requirements for consultation within the SMPs may have underestimated the political and contentious nature of these plans, particularly as climate change adaptation is more comprehensively integrated into their development and implementation.

Fairbourne Moving Forward

Following the increased media attention and challenges by local residents, in 2014 Gwynedd Council established Fairbourne Moving Forward (FMF), a multi-agency group set up to help manage coastal planning and adaptation in Fairbourne. The agency includes representation from the local community council, Gwynedd Council, Natural Resources Wales (NRW), Welsh Government, Royal Haskoning (consulting engineers) and others with a stake in the coastal area (e.g. Network Rail, Natural Resources Wales). Gwynedd Council has also established a full time FMF project manager to facilitate community relations and to lead on implementation of the SMP2. However, this is seen to be an extremely challenging planning context.

*‘There is no precedent to follow in implementing the Shoreline Management Plan. No process, no best practice and no lessons to learn from other areas’
(FMF, 2016, 4)*

For Gwynedd Council, of critical concern are the relations between increasing flood risk and a decline in economic and social wellbeing. According to the 2016 FMF annual report (FMF, 2016), over the next several decades the risk of inundation is expected to contribute to decline in property values, economic blight of the community, and a decline in health and welfare of local residents. This decline is associated with the combined factors of expected sea-level rise and the SMP2 policy of managed realignment (epoch 2) and no active intervention (epoch 3).

⁶ SMPs are required to include stakeholder engagement and public consultation. However, the specific protocols are relatively flexible, as long as engagement measures involve relevant stakeholders and are systematically detailed across the various stages of the project (Defra, 2006b).

In response, FMF has initiated several projects and programmes intending to mitigate some of the immediate impacts of the SMP2 policy as well as the longer-term health and wellbeing of residents. In the short-term, FMF has established flood preparation and early warning systems (e.g. Flood Warden Group) where residents take an active role in preparing for flood events and ensuring flood warning messages are understood. In addition, NRW has made repairs to the coastal structures at Friog Corner – an area of the village flooded during the severe storms of 2013 and 2014 – and further studies have been conducted to examine the opportunities for improved defences at this location which is particularly susceptible to flood risk (NRW, 2017). For people concerned with property values and who desire to sell their homes, FMF is working towards the development of a Community Interest Company (CIC) as a means to run a buy to let scheme to enable residents to sell now and remain in place or move away (CICs are limited companies which are intended to provide direct benefits to the community in which they are located). Several other projects are underway, including, for example a climate change education programme, systematic monitoring of groundwater resources and coastal erosion and a counselling service to help residents manage the impacts of the SMP2 and the effects it may have on their mental wellbeing.

Looking to the longer-term is development of a Fairbourne Master Plan. The document will be the central mechanism through which to implement the SMP2 including ‘decommissioning of the village and relocation of its residents’ (FMF, 2017, 23). It is expected that the plan will include further studies of sea-level rise, groundwater levels and the general impacts of coastal change on the village’s built and natural environment as well as social and economic assets.

4. Discussion: Implications for the coast and adaptation to climate change

Fairbourne is one of the first (and currently the largest) UK residential communities to initiate processes of decommissioning directly as a result of climate change and sea level rise. The SMP process has demonstrated that communities are likely to be surprised and angered by coastal adaptation policies that do not ‘hold the line’ on existing defences. In this section, the paper highlights three key points and implications from the Fairbourne case that hold relevance for coastal planners and those involved with climate adaptation processes in the UK and internationally, particularly in locales where sea level rise is likely to impact residential communities.

Climate change adaption is a 'more-than-local' process, yet challenges remain to synchronise policy, guidance, and delivery

Preston et al (2015, 474) point out how climate change adaptation is 'a multi-scaled, multi-actor process', variously enabled and/or constrained by structures and actors not exclusive to an individual community. Yet, others highlight the importance of the local scale for delivery and implementation (Füssel, 2007; Mimura et al., 2014; Aguiar et al 2018; Vogel and Henstra, 2015). The Fairbourne case study serves as a useful heuristic for both of these framings.

For example, the West of Wales SMP2 is one of 22 SMPs that make up a national evidence base for coastal policy making. As strategic documents, they involve 'planning across local planning authority boundaries to provide for the needs of larger than local areas' (DCLG, 2015, 9) and bring together a diversity of government and non-governmental stakeholders through Coastal Groups. Climate change adaptation is embedded into the SMPs through requirements to include awareness of the 'longer-term implications (50 to 100 years) of coastal change, climate change and rises in sea levels' (Defra 2006, 8; 23). This awareness is evident within the West of Wales SMP2 which notes how '[C]limate change and, in particular, sea level rise may be a significant factor in determining when policy may change' (PCC, 2011c, 6.2). Policy recommendations for Fairbourne are situated in this multi-scaled and multi-actor framework and process. In other words, Fairbourne's decommissioning cannot be read as a community-led response to climate change but rather, one that is situated in a multifaceted and more-than-local process. However, in terms of the delivery of SMP2s, Natural Resources Wales notes how implementation and communication:

...should ideally be done at a local level, with sensitive understanding of local issues and needs and by involving the local communities impacted. The Welsh Government can provide strategic direction and support, however decision making, planning and adaptation must be delivered locally'. (NRW, 2016, 7).

Yet, in a follow-up interview (interviewee 1, 9/03/18), the FMF project manager noted how implementation and delivery remained an immense and somewhat isolating challenge as, in her experience, there was 'limited understanding of adaptation responsibility' beyond the local authority. Furthermore, she noted how

stakeholder participation was inconsistent or disengaged at times and funding for implementation has not yet been identified. Overall, she stressed that the experience in Fairbourne had highlighted the difficulties associated with the so-called ‘local’ delivery of climate adaptation policy.

Situated vulnerabilities means uneven processes and outcomes.

It is also evident that the ability of communities to engage with and respond to the challenges of coastal change will be uneven. While climate change will have serious impacts globally, planning and adaptation ‘outcomes will depend significantly on the types of capacities available to these communities’ (Begg et al., 2015, 695). In other words, disparities in the ability to adapt to change will likely produce an uneven experience of local resilience. Thaler and Priest argue that there is a ‘gap between the downscaling of responsibility and the transfer of resources’ (2014, 418) and as a result affluent communities are likely to have a stronger role and impact on decision-making than those in less well-off areas of the country. This is of critical importance as coastal communities are among the most deprived in the UK (Corfe, 2017). Others note that the least well off and most vulnerable are likely to suffer the most from the effects of climate change (Agyeman et al., 2009). Somewhat particular to Fairbourne is the presence of a high proportion of older people with 35% of the village residents over 65 years old,⁷ compared with 16% in the UK overall (ONS 2012). As such, planners who are conducting coastal adaptation planning must recognise a range of constraints, challenges and opportunities that often coincide with older populations (Buffel et al., 2012). This awareness might include being sensitive to physical (e.g. mobility and access) and mental health (e.g. isolation) issues as well as the benefits and desires associated with ageing in place (Landorf et al., 2008) including, for example, the comfort familiar environments give during periods of impairment (Gitlin, 2003). The Fairbourne case suggests that the development and implementation of SMPs (and climate adaptation policy more generally) must include attentiveness to situated vulnerabilities (e.g. local levels of deprivation, demographics) and how adaptation might adversely impact particular communities and demographics.

⁷ Demographic data for Fairbourne includes the small output areas: W0000427; W0000428; and W0000429. See: <http://infusecp.mimas.ac.uk/infusewizgeo.aspx>

The complex and controversial nature of climate change means communication and framing is difficult and sensitive

The Fairbourne case highlights difficulties associated with everyday understandings of climate change. Research suggests that ‘laypeople’ may struggle to ‘understand the complexities of climate science’ (Wibeck, 2014, 396) and can conflate concepts such as ozone depletion and global warming. While this may sound patronising, much of the work to explain the impacts of climate change on the coast involves relatively technical studies of coastal processes, geomorphology and SLR modelling which can be difficult to translate into easy-to-understand formats. Furthermore, the impacts of climate change are not typically observable on a day-to-day basis and can seem remote and intangible (Few et al., 2007b; Moser and Dilling, 2004). As a consequence, some form of representation (e.g. models, images, maps) is generally needed in order to make climate trends and impacts perceptible. Experience in Fairbourne suggests that a great deal of work is likely needed to communicate the ‘intangibility’ of climate change to people who may not be familiar with the science and who may not feel the urgency of these issues. For example, the FFC representative found the SMP2 difficult to read as it was quite ‘technical’ and full of unnecessary and unhelpful jargon (interviewee 3, 15/7/19). Yet, in a follow-up discussion (interviewee 2, 17/03/19), the lead engineer expressed dislike of the word ‘technical’ to describe the SMP2 and noted how efforts were made to ensure it was readable and understandable by those without coastal engineering experience. These differing viewpoints point to significant discrepancies in the expectations of how to communicate the evidence surrounding coastal adaptation and climate change.

Furthermore, as noted above, the media has been particularly important in communication of the decommissioning narrative in Fairbourne. Since 2014, Fairbourne has had a relatively high profile in the national media. In separate interviews, both the FMF project manager (interviewee 1, 9/3/18) and FFC representative (interviewee 3, 15/07/19) found this attention to be overwhelming and at times, unhelpful. However, the FMF project manager indicated she had recently engaged with national media in an effort to draw broader attention to the difficulties they are facing with implementation. Overall, these experiences point to the need for purposeful and sensitive communication strategies that include consideration of the media in dissemination and outreach.

5. Conclusion

This paper has sought to fill a gap in understandings of adaptation to climate change in the context of coastal planning. In England and Wales, coastal planning via the SMP process provides a means through which to pro-actively plan for climate change. In the West of Wales and at Fairbourne, planners and engineers are incorporating the impacts of climate change and SLR in an effort to avoid potentially catastrophic conditions. Fairbourne is located in a vulnerable coastal site and projections for SLR over the next 100 years suggest that existing defences will be inadequate to protect the community. With few alternatives available, such as new infrastructure, the recommended SMP policy is for eventual abandonment of defensive structures and transition away from the coast. It is likely that this scenario will be repeated elsewhere in the UK as the impacts of climate change become more evident and embedded into planning and decision-making. Globally, it is expected that stronger and more frequent storms, coinciding with SLR, will increase the vulnerability of people living in coastal areas. Difficult decisions must be made regarding how best to protect livelihoods. As such, the Fairbourne case, while an unusual case in the UK, provides a useful understanding regarding how planners might face the challenges associated with these contexts. The discussion section highlighted three main implications for the coast and adaptation to climate change. These included the challenges with local delivery of multi-scalar and multi-actor climate change adaptation; the potential for uneven processes and outcomes reflective of situated vulnerabilities and the need for a robust communication plan that involves the media. It is hoped that the Fairbourne case study and discussion presented in this paper can provide useful lessons and points of debate and consideration for planners working in vulnerable coastal settings and managing climate adaptation processes in the UK and elsewhere.

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Appendix: Interviewee codes

Interviewee 1: project manager for Gwynedd Council (2/11/17; 9/3/18)

Interviewee 2: lead engineer involved in development of the SMP (2/11/17; 17/3/19).

Interviewee 3: Fairbourne Facing Change representative (9/3/18 and 15/7/19)

Interviewee 4: Fairbourne resident 1 (9/3/18).

Interviewee 5: Fairbourne resident 2 (9/13/18)