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Transitions in modes of coastal adaptation: addressing blight, engagement and sustainability

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Coastal defences have long provided protection from erosion and flooding to cities, towns and villages. In many parts of the world, continued defence is being questioned due to both environmental, sustainability and economic considerations. This is exemplified in England and Wales, where strategic Shoreline Management Plans envisage realignment of many protected coasts, often with low population densities, over the coming decades. The policy transition from protection to realignment is often resisted by affected communities and can have high political costs. Whilst some preparations for such transitions have been made, the communities affected are often not fully aware of the implications of policy change, and this brings the potential for blight. In this paper, we investigate the challenges of implementing transitions in coastal policy within England and Wales. The analysis is based on data obtained from three workshops held in 2019 that were attended by council members, engineers, planners, scientists and other relevant professionals. Five conditions are found to promote contention: (i) policy actors with competing priorities and different decision making time frames (immediate to decadal to a century); (ii) divergence between regulations and *ad hoc* political decisions (e.g. in relation to the demand for new housing); (iii) limited or non-existent funding to support policy transition; (iv) community expectation that protection is forever; and (v) a disconnection between people and ongoing coastal change. Our research indicates that transitions can be better supported through: (1) integrated multi-scalar preparedness for coastal change; (2) an accessible evidence base and future vision to nurture political confidence in adaptation; and (3) defined, time-bound and accessible diverse funding streams to achieve transitions. Critically, these generic actions need to be embedded within the local political and planning system to facilitate transition to more sustainable coasts and their communities.

KEYWORDS

transition, coastal change, coastal blight, planning, policy, contention, coastal zone

1 Introduction

The coastline of England and Wales extends more than 7,300 km and exhibits extreme variability in geomorphology and coastal processes, with negligible erosion along hard rock cliffs to retreat at 2m/yr or more along softer coastlines. Extensive low-lying areas flood or have the potential to flood without protection. Development and population growth necessitated a largely *ad hoc* expansion of defences from the late 19th century. By the late 20th century, a more coordinated approach to management emerged in the form of strategic Shoreline Management Plans (SMPs). SMP policies aim to steer sustainable development in a cost-effective manner (Nicholls et al., 2013), with a growing emphasis of working with natural processes of change (European Commission, 1999). However, when forward-looking shoreline management requires a transition (for a definition of transitions, see [Supplementary Material](#)) from one policy to another – for example, from a formal policy of protection to one of retreat (e.g. Buser, 2020), this can generate significant controversy within the communities affected. The current generation of SMPs envisages a large number of transitions from protection to managed realignment around the coast of England and Wales. However, these transitions have not been occurring at the required pace (Committee on Climate Change, 2018), such that flood and erosion risks are being stored up for the future, whilst maintaining public expectation that existing defences will be sustained.

The decommissioning of defences is often socially and politically contentious (Kirby et al., 2021), particularly when loss of land and/or infrastructure loss is unexpected and gives rise to a reduction in economic, environmental and social capital. In England and Wales, there are multiple examples of the implications of a transition to realignment being inadequately understood before it has been widely publicised (e.g. at Selsey in southern England (Famuditi et al., 2018) and Happisburgh in eastern England (Rouse et al., 2018)). For homeowners, realignment can be a source of bewilderment, even to those living in areas not directly affected. Moreover, it can be hard to determine which is the appropriate organisation to take responsibility for such change (e.g. Hansard, 2014).

Loss of economic, environment and social capital constitute a form of blight (defined as ‘conditions upon or affecting premises...which are detrimental to property values, economic stability, or to the quality of the environment’ (City of Baton Rouge, 2022); see [Supplementary Material](#) for a fuller explanation). Drivers of blight can be slow, such as long-term decline in economic activity or depopulation, both of which are common in rural coastal locations. Rapid blight may also occur due to a sudden policy transition, or natural disasters such as flooding, erosion, or landslides. In the UK, many coastal towns score poorly against widely used indicators of deprivation and are subject to adverse health, employment, and lower education outcomes than towns inland (Office for National Statistics, 2020; Whitty and Loveless, 2021; Barton et al., 2022). However, the potential for enhanced deprivation and what might be termed ‘coastal blight’ (see [Supplementary Material](#)) as a direct result of changes in shoreline

management policies has not been widely investigated. From both social science and practitioner perspectives, better understanding is needed to reduce the potential for coastal blight via smoother transitions in shoreline management policy.

Lessons from the delivery of difficult socio-technical transitions in other settings, such as energy, transport, housing and agri-food systems (Smith et al., 2005; Hodson and Marvin, 2010; Geels, 2019), could aid understanding and the implementation of contentious transitions in shoreline management policy. Examples of the challenges related to transitions include lock-in mechanisms related to sunk investments, entrenched behavioural patterns, vested interests, extant infrastructure and the presence of favourable subsidies and regulations (Geels, 2010). Research on socio-technical transitions is increasingly adopting a multi-scale perspective to the identification of pathways towards and through transitions (Smith et al., 2010). This highlights the importance of including actors at different scales, together with their diverse knowledge needs and priorities (Geels et al., 2016).

In this paper, we explore the implementation of contentious policy transitions, as exemplified by Shoreline Management Plans in England and Wales. We consider ways of reducing the potential for coastal blight that might arise as a consequence of these. The paper is structured around an historical overview of shoreline management in England and Wales (Section 2); stakeholder and data analysis (Section 3); analysis of the challenges in delivering contentious policy change and potential drivers of blight (Section 4); and a set of recommendations on how best to enable smoother transitions (Section 5). Whilst the geographical focus is England and Wales, the methods applied and the insights obtained have broader applicability wherever significant transitions in shoreline and other coastal management policies are envisaged.

2 Background and study motivation: a brief history of shoreline management in England and Wales

Up to the mid-19th century, hard engineering on open coasts in England and Wales was targeted at assets linked to industry, navigation, the military and agriculture (including the reclamation of extensive tracts of coastal wetland). Towards the end of the 19th century, the application of hard engineering expanded in response to growing coastal populations and the development of seaside towns, due especially to greater leisure time and tourism. Defence construction was often triggered by extreme events that caused severe damage and/or loss of life (Haigh et al., 2017; Table 1), notably the 1953 ‘Big Flood’ (Wadey et al., 2015), which led to the Thames Flood Barrier in central London (Table 1).

By the 1980s, the effectiveness and suitability of continued *ad hoc* hard defence along the entire English and Welsh coast started to be questioned in favour of more sustainable management involving consideration of the whole coastal system (Ledoux et al., 2005; Pontee and Parsons, 2010; Nicholls et al., 2015). There was also a move to risk-based management of flooding and erosion (e.g.

TABLE 1 Coastal flood events in the UK since 1850 that have been considered severe (ranked 5 out of 6) or a disaster (ranked 6 out of 6) due to the damage caused, based on the analysis of [Haigh et al. \(2017\)](#).

Date	Severity	Location and main impact
28 Nov 1897	5	North-westerly gale, impacting Scotland and eastern England. 1 death. Buildings, roads and farmland flooded.
26 Aug 1912	6	Gales and heavy rains, impacting Norfolk and Suffolk. Deaths, including livestock. Transport, agriculture land and towns flooded.
26 Dec 1912	5	Mid-Atlantic storm, impacting central southern England. Infrastructure destroyed and towns flooded.
28 Oct 1927	5	Atlantic storm, impacting northern England and Wales. 6 deaths and livestock. 1,200 properties, transport and energy affected.
6 Jan 1928	5	North Sea storm, impacting east coast, notably London with 14 deaths. Properties flooded. Transport and energy disruption.
31 Jan 1953	6	North Sea storm, impacting Scotland, eastern England and mainland Europe. Worst peacetime disaster in UK, with 307 flood-related deaths in England and 19 flood-related deaths in Scotland. 24,000 houses were flooded.
11 Nov 1977	5	Storm over northern Scotland moving towards Scandinavia, impacting Irish Sea, Scotland, parts of eastern England. 1 death, plus livestock. 5,000 properties flooded.
11 Jan 1978	5	Storm over northern Scotland moving into the North Sea, impacting eastern England. 1 death. Properties flooded and disruption.
13 Dec 1981	5	Multiple low pressure storms over southern Wales and England, impacting southern England, especially Somerset. 24,500 livestock died. Flooded properties and transport routes.
26 Feb 1990	5	Storm over northern Scotland moving towards Scandinavia, impacting north, west and coast coasts of UK. 50 premature deaths. 3,076 people flooded.
11 Jan 2005	5	Storm over northern Scotland moving towards Scandinavia, impacting Scotland and north of England. 5 deaths. Transport disruption and erosion.
6 Dec 2013	5	Storm over northern Scotland moving towards Scandinavia, impacting east and west England plus Wales. 700,000 livestock died, 2,800 properties flooded. Significant erosion.

[Thorne et al., 2007](#)) and new methods of public funding allocation based on benefit-cost analysis (e.g., [Penning-Rowse et al., 2013](#); [Penning-Rowse et al., 2014](#)). This highlighted the questionable public benefit of many historic engineering schemes where more was spent on protection than the losses avoided. A first set of Shoreline Management Plans (SMP1) was developed for England and Wales in the mid 1990s to promote greater coordination and longer-term planning ([MAFF, 1993](#); [Leafe et al., 1998](#); [Pontee and Parsons, 2010](#)). SMP1 largely maintained existing policies of protection and retained existing defences ([Nicholls et al., 2013](#)), a decision that reflected the dominance of short-term stakeholder expectations and the challenges of longer-term adaptation within a non-statutory process. A second round of SMPs (SMP2) was developed in the late 2000s ([DEFRA, 2006a](#); [DEFRA, 2006b](#)). This divided the coast of England and Wales into 22 segments based on natural sediment system boundaries and 1,998 policy units. Appropriate shoreline management options were determined for three epochs: (i) from the first decade of the 2000s for 20 years (present day), (ii) the next 30 years (medium term); and (iii) 50 years thereafter (long term). Every policy unit was allocated one of four management options for each epoch:

- (i) No active intervention (NAI) - no investment in new defences, maintenance or upgrade of existing defences;
- (ii) Hold the line (HTL) - keep the line of defence approximately where it is now, existing defences are

maintained, replaced or upgraded along their current alignment;

- (iii) Managed realignment (MR) - retreat defences landward, giving up some land to the sea to form a more sustainable inland defence in the long-term; and
- (iv) Advance the line (ATL) - reclaim land from the sea by building new defences further seaward.

The envisaged variation in the policy mix over the three time epochs is summarised in [Figure 1](#) (see also [Supplementary Table 5](#)). Approximately 12% of policy units experience a transition to an alternative policy option by epoch 2 and 11% between epoch 2 and epoch 3. Notably, around 9.7% are envisaged to transition from HTL in epoch 1 to either MR or NAI in epoch 2 ([Smith, 2014](#)). In terms of shoreline length, some 645 km of defences are no longer maintained or subject to MR by epoch 2 (from a policy of HTL), increasing by 340 km by epoch 3 (with 3,228 km of coast remaining actively defended).

From a regional perspective ([Supplementary Table 5](#)), the south west of England and Wales are projected to experience the greatest number of policy unit changes within SMP2 and together represent 54% of the national coastline and 55% of policy units subject to planned MR by epoch 2. In Wales, 70 MR policy units were identified in epoch 1, increasing to 120 by epoch 3 ([Smith, 2014](#)). In contrast, the wealthier south east of England has the fewest number of policy units subject to MR, and concern has already been

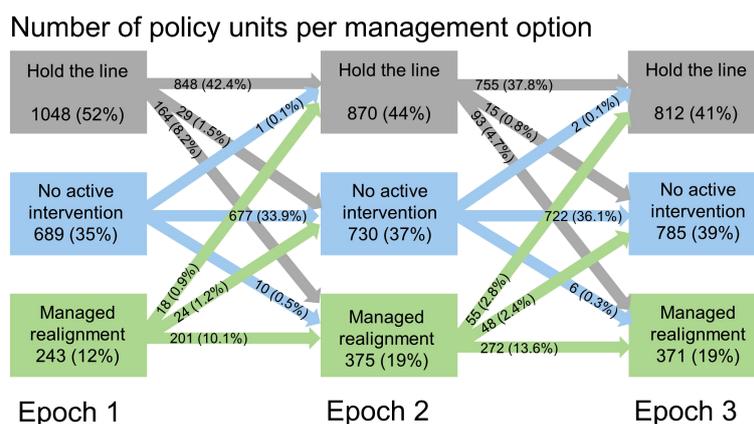


FIGURE 1

Number of policy units for each of the three epochs defined in SMP2 for England and Wales (Smith, 2014). Percentages may not add up to 100% due to rounding and removal of Advance the Line/other options, which represent <2% of the total coastal length. Arrows show the transitions that underlie the changing policy mix.

expressed over the equity of this geographical variation in decision making (Cooper and McKenna, 2008).

Although transitions in policy over time are a fundamental aspect of SMP2 decision making (DEFRA, 2006a; DEFRA, 2006b), there has been little formal consideration of how to achieve them (Brown, 2008; Day et al., 2015; Sayers et al., 2022). This is partly a consequence of the fact that central government only facilitates coastal defence and funds this through grant-in-aid (or, since 2011, through the addition of Partnership Funding whereby other organisations can boost funds for schemes that are not completely economically viable). Where defences are not justified on a cost basis, the burden falls on the landowner and the associated communities. Central to SMP2 was the explicit recognition by central government that many defences would not be funded in the future, but the contentious policy changes that this implies passed largely unnoticed by the wider public, despite publicity.

Recognising that sea-level rise and climate change are a growing hazard to coastal zones, and that policy transitions are not occurring even at the pace required to meet SMP2 recommendations, the Committee on Climate Change (2018) analysed the long-term challenges of shoreline management in England. The finance required to implement SMP2 was highlighted as one of the biggest challenges, with costs estimated to be between £18 to £30 billion over the 21st century. Moreover, for between 149 and 185 km of the English coast for which HTL is the SMP2 policy, it will not be cost beneficial to protect or adapt as currently planned. For a further 1,460 km of the coastline designated as HTL to the end of the century, the benefit-cost-ratios are below current thresholds. More recently, Sayers et al. (2022) suggested that 1,600 to 1,900 km of England's shoreline currently designated as HTL are likely to see increasing pressure to realign, with implications for ~120,000 to 160,000 residential and non-residential properties by the 2050s. This would require many more policy transitions from HTL to MR/NAI than shown in Figure 1.

Within the SMP2 process, it was quickly recognised that policy transitions, even if well planned, require changes in politics,

mindset and expectations - all of which raise social concerns and create political tension. Coastal Change Management Areas were introduced in 2012 (Ministry of Housing, Communities & Local Government, 2012; Royal Haskoning DHV, 2019) aiming to resolve issues relating to coastal change and development, but their effective uptake has been limited (Kirby et al., 2021). Despite various consultations on managing coastal policy change (DEFRA, 2019; Environment Agency, 2019), the full implications of policy transitions were not explicitly recognised by the wider public. New ideas and operational methods are needed to ensure smooth and just transitions and avoid coastal blight, while simultaneously increasing the range of adaptation means to enhance resilience (Townend et al., 2021; Environment Agency, 2022a). This includes better explanations of funding strategies, national leadership, communication with communities affected and improved delivery mechanisms to support adaptation measures (Environment, Food and Rural Affairs, 2019; DEFRA, 2020; Environment Agency and DEFRA, 2022).

3 Methods: approach to coastal transitions

To explore perspectives on the consequences of contentious policy change and transitions instigated through Shoreline Management Plans in England and Wales, we use a qualitative mixed methods approach. The approach combined three one-day workshops as the main source of data collection (University of Southampton ethics number 48389) supplemented by reviews of the literature.

3.1 Stakeholder analysis

Stakeholder analysis was applied using two steps (following Reed et al., 2009): stakeholder identification and stakeholder categorisation. Stakeholders were identified first by organisation,

notably those that formulated or use SMPs, e.g. government departments, borough councils, non-government organisations (NGO). Within those organisations, specific stakeholders (henceforth known as actors) were selected depending on their level of engagement with SMPs (e.g. strategic overview, creator, advisor, day-to-day management). Actors were initially identified through the authors' networks. Additional participants were identified through snowballing (a commonly used method using the contacts of contacts, e.g. see [Pasquier et al., 2020](#)) to ensure representation from all relevant organisations (e.g. local councillors who were outside of our networks). The second part of the stakeholder analysis involved categorising actors according to their organisation ([Table 2](#)) and their interests in the coast. Following [Prell et al. \(2009\)](#), actors were categorised by job role ([Table 3](#)) (e.g. scientist, manager, environmentalist, planner) and career stage, to ensure a breadth of actor experience.

Approximately 180 actors were identified and invited to one of three workshops in June and July 2019; 75 attended. Actors with a national or strategic overview were invited to a workshop in London (June 2019), which focused on an overview and strategy; 19 attended. Those with more operational or local roles were invited to one of two regional workshops in Havant near Portsmouth (36 attended) or York (20 attended). Two actors attended both national and regional workshops. Actors were invited by email, explaining the purpose of the workshop, why they were invited and what we hoped they would get out from attending (plus the necessary ethics procedure and permissions). After the workshops, actors were provided with an update of initial findings, and approximately a year later were sent a short policy brief summarising key findings of the research project ([University of Southampton, 2020](#)).

TABLE 2 Workshop actors by organisation.

Code	Organisation	Havant	London	York
A	Another	1	3	3
BC	Borough Council	4	0	7
CIC	City Council	2	0	0
DCC	District or County Council or Coastal Partnership	7	0	2
GDC	Government department/ ministry or committee	0	2	0
IP	Infrastructure or utilities provider	0	2	0
NGO	Non-Government Organisations	1	2	1
NDPB	Non-departmental public body	10	5	3
PS	Private sector	0	4	2
RFCC	Regional Flood and Coastal Committee	2	0	1
ULA	Unitary Local Authority	9	1	1
Total		36	19	20

3.2 Workshop format and questions

The workshops were designed to initiate conversations around the future of the coast, with questions generated from the literature on shoreline management ([Section 2](#)), key reports (notably [Committee on Climate Change, 2018](#); [Environment Agency, 2019](#)), peer-reviewed papers (including those reviewed in [Section 2](#) and [Supplementary Table 4](#)) and the authors' academic and industrial practice. We were particularly interested in actor visions of coastal management, long-term sustainability and how to achieve this. Participants were asked about their thoughts on coastal transitions, what data they need to measure the sustainability of coastal change decisions, and what an acceptable transition might look like ([Supplementary Tables 6, 7](#)), using pre-agreed prompts (see [Section 3.3](#)). Prompts during breakout discussions included success stories, data and indicators of change, implementing SMPs, external pressures influencing shoreline management and future challenges, including coastal and climate change.

Questions were discussed in groups of 5 to 11 people, balanced where possible, in terms of actor organisation type, role, responsibility and career stage. In each group two members of the author team (physical and social scientists and engineers) acted as facilitators, note takers and rapporteurs. Note-takers wrote or typed the discussion verbatim, with informal notes taken by all team members. A questionnaire ([Supplementary Tables 8, 9](#)) was used to collect final thoughts and feedback at the end of the workshop; this informed further workshops. Workshop transcripts were anonymized using codes in [Tables 2, 3](#). For example, a Unitary Local Authority (ULA) engineer (En) would be given the code ULA-En; or an infrastructure or utility provider (IP) scientist (Sc) would be given the code IP-Sc. Organisations and job roles were merged where an individual could potentially be identified.

3.3 Data analysis

Transitions require a multi-level perspective ([Smith et al., 2010](#)) and a range of actors ([Geels et al., 2016](#)) as they tend to occur over long timescales. Underpinning all transitions are the key components of change across scales: resourcing, regulation, learning and governance across, thus, we adopted an analytical framework that takes these elements into consideration. In 2020, the workshop transcripts were manually coded, following [Suckall et al. \(2014\)](#) around the themes of: resourcing, regulation, learning and governance. A unique cross-theme code rapidly emerged revealing the difficulty of SMP implementation. This new code highlighted the importance of coastal transitions (for national economic sustainability) but recognised that they could potentially harm community sustainability (i.e. create coastal blight). Contentious coastal decisions became the central focus of the analysis as they illustrate the challenge of achieving transitions, and allow for consideration of factors that could reduce blight risk in the future. The new "contentious coastal decisions" code was re-analysed, and two clear sub-themes relating to policy and societal

TABLE 4 Issues identified in hindsight (as noted by a 'x') that have made SMP2 hard to deliver.

Issues identified in hindsight		Challenges in delivery of SMP2				
Lack of	Reference	Policy drivers			Social drivers	
		Multiple policy making timeframes	Demand for housing	Diversity and duration of funding	Expectation and engagement with stakeholders	Disconnect between people and nature
Clear plan to realign or withdrawal of maintenance	Brown (2008)			x		x
Continuous engagement	Ballinger and Dodds (2020)			x	x	
Data indicating future coastal change not widely communicated	Environment Agency (2022b), NDPB-En, RFCC-O	x	x		x	x
Diverse consultations	Ballinger and Dodds (2020)	x			x	x
Full consultation of finances	New Forest District Council (2010)		x	x	x	
Integration of planners	A-Sc	x	x	x	x	
Policy intent described by policy actions	Environment Agency (2020a)		x	x		x
Responsibility of different actors to take responsibility for NAI	Hansard (2014)		x	x	x	
Understanding of process	Buser (2020)	x	x	x	x	x

seen as challenges in delivering contentious policy change (Figure 3, upper half).

4.2.1 Multiple policy making timeframes

Institutions and actors influencing coastal change focus on different timeframes (Figure 3), leading to competing interests, reduced awareness of forthcoming risks and lack of support for action. Examples provided by the actors included politicians focusing on the present and therefore aiming to restore loss after

damaging extreme events, homeowners and communities focusing on the present and coming decade, and economic and spatial planners focusing on years to decades (CIC-Ec). In contrast, shoreline managers have a time horizon of up to a century. There was broad agreement by the actors that, despite stakeholder consultations (e.g. Environment Agency, 2010), different timeframes of interest led to long-term goals about shoreline management not reaching sufficiently diverse audiences.

One actor claimed that during SMP consultations “the [town] planners just wouldn’t turn up...there was no appetite for it. We were looking at the long term, 100 years. We weren’t looking at the short term. The [town] planners wanted to know what would happen now” (DCC-Sc). For those living at the coast at the time of SMP formation, many were unaware of the intentions and significance of SMPs at their formation (Famuditi et al., 2018; Buser, 2020), noting that “it is so hard to engage your average person strategically until it is ‘in my back yard’” (DCC-En). For incoming residents, second home owners and holiday makers, consultation on significant coastal change had limited value as it might be felt that “decisions have already been set by the time the community is involved” (A-Sc) or the significance of consultation was not recognised. This mirrors the identification by Ballinger and Dodds (2020) of a lack of transparency in local policy, thus creating a delivery gap. These factors are listed in Table 4 as points that in hindsight made SMPs potentially challenging to deliver. This meant that many stakeholder groups were not aware of contentious policy

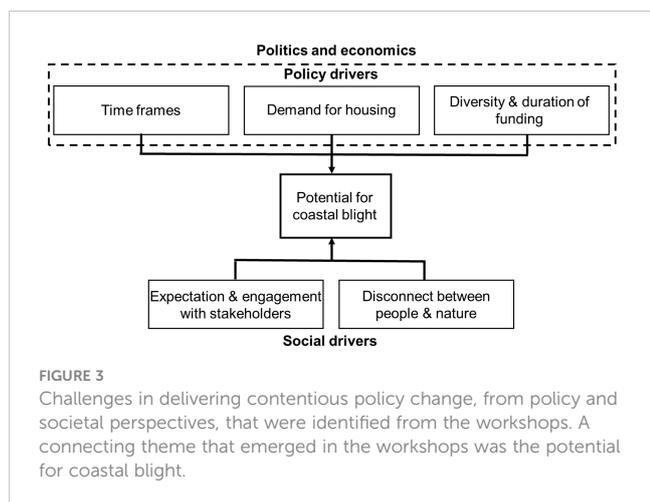


FIGURE 3 Challenges in delivering contentious policy change, from policy and societal perspectives, that were identified from the workshops. A connecting theme that emerged in the workshops was the potential for coastal blight.

change until it had to be enacted, creating a fear of coastal blight as there was no time to prepare for change.

This delivery gap was demonstrated along the Slapton Ley coastal road in Devon, which was at high risk of erosion. Residents were concerned that the ‘loss of coast road would cut trade in half’ (Kingsbridge Gazette, 2001, 9 February 2001 as cited by Trudgill, 2009) and the local member of Parliament quoted that ‘the electorate want their road back’ (Hansard, 2001) - the plan for this coastal road in SMP2 was managed realignment (South Devon and Dorset Advisory Group, 2011). After the devastating storms of winter 2013/14 (Masselink et al., 2016) the planned realignment was stalled as the then Prime Minister, David Cameron, made post-flood recovery funds available for continued defence rather than supporting long term policies, even where communities had been prepared for realignment. Commenting on the stormy winter in general, Cameron remarked “But more needs to be done, and my message to the country today is this: money is no object in this relief effort. Whatever money is needed for it will be spent. We will take whatever steps are necessary.” (Cameron, 2014). This example highlights that a short-term “political charge” (NDPB-En) can drive decisions influenced by cronyism or political culture (Krane, 2007), rather than pursuit of a long-term strategy that involves transitions. Differences in timescales of strategic planning and subsequent actions to avoid transitions reduce coastal blight in the short term, but store up risk in the longer term.

4.2.2 Divergence between regulations and political decisions (demand for housing)

The struggle to include planning officers in SMP consultation at a practical level (Table 4) left a legacy of insufficient integration of many levels of planning into managed realignment schemes (Kirby et al., 2021). Within SMP2 guidance (DEFRA, 2006a; DEFRA, 2006b), there is an acknowledgement of the need to ‘link to planning’ and the need to ensure ‘that representatives of both planning and engineering disciplines are involved to ensure appropriate ‘buy in’ (DEFRA, 2006b, p. 206 and p21 respectively) to discourage ‘inappropriate development’. Current planning guidance states that SMP advice needs to be ‘given consideration’ in spatial planning, but it does not legally have to be followed (Department for Communities and Local Government, 2009). With significant demand for housing, development land is often allocated on the coast or flood plains, without at times fully appreciating the long-term implications of the hazards that exist (Figure 3). Hence, whilst there was and is a will to engage development planners, in practice this has been difficult to achieve and to maintain in day-to-day operations.

Even with consultation, the type and nature of adaptation needs to be questioned. Development must be ‘safe for its lifetime without increasing flood risk elsewhere’ (Department for Levelling Up, Housing and Communities & Ministry of Housing, Communities and Local Government, 2022a). Language like this raises expectations among development and spatial planners that flood risk can be reduced by a one-off solution, rather than acknowledging that adaptation to coastal change needs to be a continuous process. In local council development planning it was

claimed, “[the] business case is key. [As long as] coastal developers see value in coastal properties” (NDPB-O), development will continue, even if coastal managers “advise people not to build in NAI areas” (BC-Sc). In practice, this meant the SMP has been challenging to deliver (Table 4). Hence, stronger and continued guidance is needed to develop planning as an adaptation mechanism, such that it becomes part of the transition process.

Part of the challenge of adapting to coastal change and climate change is how to address the lack of understanding of the risks by those who process and approve local planning applications. Planners “rely on our coastal teams for advice ... [and are] ... under pressure to provide houses for central government” (BC-DPE). Some questioned “How can we adapt the buildings to stand up against these changes? The buildings are there. How can we change them?...have shops on the ground floor? There isn’t the link [in planning policy]” (BC-DPE). Some actors were more confident about working with planners than others, but this largely depended on personal relationships. Whilst developments can be more resilient to flooding, long-term risk of coastal blight can continue if localities are frequently flooded or if whole communities do not bounce back after an incident quickly. It is clear from this that contentious policy changes are not being sufficiently integrated into spatial and development planning or resilience measures, which has the secondary effect of actually increasing risk.

4.2.3 Diversity and duration of funding

Coastal change is influenced by management practices of engineering, spatial planning, insurance and preparedness (van der Plank, 2021; van der Plank et al., 2021). However, shoreline management policy options focus primarily on engineered shoreline positions (see Supplementary Material). Thus management practices are not fully reflected in the SMPs, which has implications for the diversity and duration of funding opportunities to support contentious policy change (Figure 3).

Concerns were raised by actors about the availability for funding to support all four shoreline management policy options (HTL, ATL, MR and NAI), as there is not the financial commitment to deliver everywhere (Committee on Climate Change, 2018; Sayers et al., 2022). Funding to support NAI and MR was often missing: “the only funding schemes that stick, is to hold the line. Managed realignment tends to be assisting with the creation of habitat” (NDPB-En). Even so, actors recognised that this confused the public, claiming “[households] think it [Hold The Line] is funded, but it is often not” (ULA-En), even though it is noted in SMPs that ‘a policy of HTL, ATL or MR does not mean that public funding is secured or guaranteed’ (New Forest District Council, 2010). This was viewed as another reason why SMPs have been hard to deliver (Table 4). This applies also to inland flooding as “David Cameron on the Somerset Levels [after the 2014 floods] – he said - we need a strategy here. But a strategy existed – it had just not been funded” (claimed PS-Cn). Despite flood defence funding (including inland flooding) increasing by three quarters from 1997 to 2010 (Bennett, 2010; Bennett and Hartwell-Naguib, 2014), obtaining specific project funding from central government to deliver coastal policy (known as Grant-in-Aid) is hard, leading to SMPs being seen as

“aspirational” (NDPB-En, DCC-En, A-O, Ps-Cn). Whilst Partnership Funding (Environment Agency, 2020a) and 100% private funding can shore-up funding gaps, there are concerns about the equitable delivery of shoreline management (e.g. Harvey, 2019) as private defence “comes with power” (DCC-Sc). It is also “piecemeal” (DCC-Sc), and risks a return to pre-SMP times as the “problem gets pushed to other places” (NGO-EHH). Hence, with the realisation that lack of funds means dwindling levels of protection, there needs to be a shift to resilience (with, where practical, reduced engineered protection), to avoid the development of coastal blight.

Coastal Change Management Areas (Royal Haskoning DHV, 2019) were created to help those areas facing a policy transition, but they do not generate funding, hence “you have a funding gap” (ULA-Sc). Actors perceived that the full range of adaptation policies are not linked to funding outcomes, especially as the climate changes. In 2022, the Environment Agency (Environment Agency and DEFRA, 2022) created innovative new funds to explore methods to support the policy goal of managed realignment on eroding coasts, which may help. It is clear from all this that challenging policy changes are particularly hard to enact in an uncontentious way without appropriate funding.

Timing a transition in policy with an extreme event may appear opportune, but in practice may not be the best option. The UK Government’s Bellwin scheme for post-disaster emergencies allows financial assistance for the ‘taking of immediate action [one month] to safeguard life or property, or to prevent suffering or severe inconvenience’ (Department for Communities and Local Government, 2017), with money after the 2013/14 storms being “no object” (Cameron, 2014). This shores-up damage but at the cost of backing away from contentious policy changes that will be necessary in the long run. At the same time, coastal managers claim that they can “spend a lot of funds for engagement campaigns for difficult to deliver projects, [then] politics wipes it away” (NDPB-En), making SMPs hard to deliver (Table 4). This can create community expectations that when defences fail, politicians step with additional funding, rather than remaining committed to existing long-term strategies that involve realignment or a shift to no active intervention.

4.3 Societal drivers

From a societal perspective, actors expressed a view that contentious policy decisions have been stalled through challenging conversations, including expectation and engagement with stakeholders and disconnection between people and nature (lower half of Figure 3).

4.3.1 Expectation and engagement with stakeholders

Buser (2020) argues that the SMP consultation process ‘underestimated the political and contentious nature’ of policy change and hence was inadequate for the scale of transition proposed. Communities in England and Wales remain

unprepared for contentious policy change. At the workshops, actors widely saw contentious policy changes as less of a political priority, due to the potential conflicts they cause. One claimed that “from a political point of view no one wants to touch this because it is so sensitive” (NDPB-EHH), as flooding is known to affect electoral outcomes (Birch, 2022). Further, some claimed “not defending a community doesn’t bring in votes” (DCC-Sc). This has meant SMP decisions made in the present become “too political. They are not about whole life asset management” (NDPB-En). As a result, there is evidence of SMP visions not being supported locally by elected politicians, or their electorate (e.g., Hansard, 2014), and both groups stall the process of change (see Table 4). Often, communities only respond to change when it starts to affect them (Buser, 2020). Thus, contentious policy change needs ongoing awareness raising and preparation to enable a smooth transition.

Significant thought went into engagement and consultation in the SMPs (e.g. Environment Agency, 2010) but, in hindsight, this did not have sufficient reach to those most affected (Table 4). This has contributed to “expectations” of and a sense of “entitlement” (RFCC-O) to defended coast, including policies staying the same in perpetuity (Figure 3). Communities have been left ‘shocked and surprised’ when they find expectations are not met (Wall, 2019; Aaronovitch, 2020; BBC, 2021). Elsewhere, this lack of public awareness has led to communities having no time to react when contentious policy change affected them (Famuditi et al., 2018; Buser, 2020), especially where people have deep ties to their homes (Bryne and Grannis, 2012). In one settlement subject to realignment (Haskoning UK Ltd, 2012; Buser, 2020), “no one objected in writing afterward ... [it was] only after a BBC documentary about the implications ... that locals organised opposition to the plan” (GDC-Sc). Some communities developed a lack of trust with governments as they felt they had not been listened to as policies were already in place (Famuditi et al., 2018). In part, this led to the formation of Coastal Actions Groups and political lobbying (Famuditi et al., 2018) as homeowners “think they have the right to be protected” (O-EHH). A combination of the limited reach and scope of consultation and subsequent engagement, thus appears to have created a lack of connection among key stakeholders affected by contentious policy change.

4.3.2 Disconnection between people and long term natural coastal processes

There is growing evidence worldwide of a low understanding of the local environment, its risks, and environmental risk management (Smith et al., 2017). This was reaffirmed at one of the workshops with one actor commenting that non-specialist coastal residents “see a wall go up and they think ‘now I am safe’” (ULA-En). This disconnect between people and their environment has led to a lack of appreciation of the facts: adaptation is an ongoing process; we can reduce some aspects of risk but there will always be residual risk; and the natural environment will always change (Figure 3).

20th century defences reduced the impact of moderate coastal floods (Haigh et al., 2022) and slowed erosion (Brown, 2008; Masselink et al., 2020), at least for the life of the defences

(Clayton, 1989). As extreme events are known to stimulate adaptation (Berrang-Ford et al., 2011), when extremes are removed, convincing non-specialists of the need to adapt becomes more challenging. This involves a shift in psychological mindset and behaviour (Heidbreder et al., 2019; Bright and Eames, 2022). In recent years, behaviour change has been seen with the reduction of single use plastics (Sandu et al., 2020) and climate change mitigation (Burch et al., 2014; Creutzig and Kapmeier, 2020). Whilst “Nature is increasingly in the public eye” (CIC-DPE), a full appreciation of the dynamics of coast and the need for continuous adaptation is yet to be realised. Hence transitions (Section 5.1) need to stem from an educational base where a threat or risk is recognised.

Martinez et al. (2020) found that cultural memory of flooding is high where residents are regularly reminded of floods and where there is high connectivity to the maritime environment. Fewer floods and new residents mean collective memories fade and over generations, communities do not know what a naturally evolving coast looks like. One engineer reflected that “We maintain a [redacted] km beach...it is the norm now, and people don’t remember what it was like before” (NPDB-En). This raises the expectation of maintaining policies and continued defence. Where contention has not previously been known, communities are not prepared for it.

The main risk of not addressing both policy and social drivers, is that coastal blight could unintentionally be created in those areas that cannot be sustainably protected into the future. We now consider the opportunities to deliver smoother transitions to plan for coastal change.

5 Results (2): enabling a smoother transition

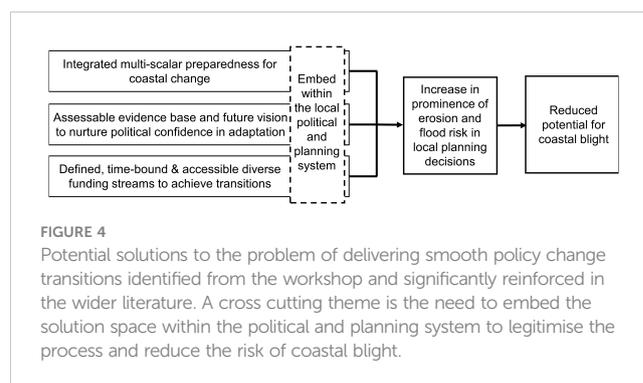
Governance issues, public opposition, uncertain planning arrangements, inadequate funding and equity issues can slow down pre-emptive implementation of contentious policies, as has happened in coastal realignment projects in other countries such as New Zealand (Lawrence et al., 2020). Evidence from other non-coastal socio-technical transitions highlights that these are not unusual characteristics, and it points to a set of actions to unlock challenges relating to policy and social drivers. Two key elements are identified: (i) acknowledgement of loss from sunk investments (e.g. old defences); and (ii) recognition of factors affecting the present situation (Unruh, 2000; Geels, 2010). In the latter category, this includes consideration of factors affecting the status quo, i.e.: existing vested interests - what/who are they and what do they care about (e.g. planners, land developers, politicians, local residents, insurers), behaviour patterns across all relevant stakeholder (e.g. in relation to coastal design and use), regulations and subsidies affecting public choices (e.g. extant funding streams), and availability of infrastructure options (e.g. non-defence adaptation interventions). These groupings are shown in Figure 4. All are embedded within the local political and planning system.

5.1 Integrated multi-scalar preparedness for coastal change

Coastal change, even when unexpected or adverse in its impacts does not constitute a disaster (under the standard United Nations Office for Disaster Risk Reduction definition), although the outcomes of coastal change can be physically, socially, economically and psychologically damaging to those affected. Lessons on preparedness for change can be drawn from the literature on disaster resilience (exemplified through the UN Sendai Framework, 2015-2030), for example by communicating preparedness as strategies to reduce long term exposure, vulnerability, and risk (Figure 4).

Actors were clear that greater preparation for transitions are needed, particularly with climate change, along with the need for long term engagement. For example, one claimed “[we have] 40 years to get ourselves into a position where we have nothing to defend” (Ps-Cn). Actors were less able to articulate what it means to be prepared for coastal change, or to specify the outcomes that better preparedness could accomplish. Workshop discussions were more focused on how people should be involved in preparedness: the nature of continuous engagement, role of formal guidance, and the use of publicly accessible visual spatial data.

Social acceptance of change achieved through engagement and education occurs slowly (Lambert, 2013). Two case studies from New Zealand show that proactive, sustained and local authority-led engagement can result in increased acceptance of adaptation actions, and can be completed in advance of a hazard event (Schneider et al., 2020). However, little is known about what constitutes effective public engagement and education and more insight is needed to overcome individual and social barriers to engagement with climate - including coastal - change (Lorenzoni et al., 2007; Whitmarsh et al., 2021). Examples of methods of education and engagement (collated from coastal and other environmental settings) for different purposes are shown in Figure 5 and Supplementary Table 1. Engagement to enable a smooth transition clearly needs to happen in different ways for the wide range of stakeholder affected by environmental change. It needs to create greater transparency in decision making and access to information to help individuals understand why a transition



needs to be made. This includes using non-technical terms, the local historical context and identifying positive actions that people can take in relation to flooding and erosion (Environment Agency, 2015).

Several novel methods of engagement were suggested at the workshops. One actor noted: “We went to a carnival [in our town] and talked to people who didn’t go to those meetings [about long-term protection of the town], and they were much more philosophical” (PS-Cn). One key message is that as coastal change is intergenerational, “children need to understand the challenges” (NDPB-O) as they will be living with the consequences of our decisions today. This mirrors the argument of Bryne and Grannis (2012) that long-term changes require long-term planning. Hence education and engagement (Figure 5), need to be far more extensive, long term and forward-looking than at present, possibly requiring broader policy engagement by non-environment facing departments such as the Department for Education.

Actors noted a need for accessible formal guidance on local impacts of climate and coastal change, and adaptation needs and options. Part of this involves looking at international best practice. One remarked “I think we need to provide honest and transparent evidence for the planners, we need to show this spatially” (DCC-En), which was a key cross cutting issue (see Figure 4) in enabling a smooth transition. Buser (2020) also found limited guidance for planners nationally, while Reckien et al. (2018) noted that only 26% of European cities have adaptation to climate change plans (which may include planning for the effects of sea-level rise). Where adaptation policies exist, there is limited evidence of their

implementation. For example, Olazabal et al. (2019) found that 54% of adaptation policies for port cities worldwide had not been implemented. Studies from France, United States, India, Indonesia and Ireland document a lack of consideration of coastal risks in spatial planning (Robert and Schleyer-Lindenmann, 2021). To address the lack of understanding of processes and impacts of and adaptations to coastal change among spatial, development, economic and town planners and local town councillors, Continuing Professional Development (e.g. RTPI, 2021) could provide an opportunity for education. By integrating coastal change science into infrastructure planning decisions, more sustainable investment and regeneration decisions can be taken explicitly to enable smoother transitions.

Kelly and Kelly (2023) considered ‘readiness’ as a way of learning, to acknowledge the role of emotions and taking a more integrated view of the issue. Learning can help prepare for change. For example, future coastal change could be seen through visualisation technologies (e.g. Nicholls et al., 2015; Payo et al., 2020) (Supplementary Table 1) for both non-experts and experts to avoid “a false sense of security” (DCC-En). Visualisations (e.g. artist impressions of a coast 50 years’ time) need to occur alongside an effective narrative to prevent scaremongering. Opportunities to learn can come from others, such as in “Scotland [where] they have a dynamic coastal map that helps people see impacts” (NGO-EHH). The Scottish government’s ‘Dynamic Coast’ online portal provides evidence of past coastal change, and projects future coastal change, in order to support Scottish decision-makers to deliver a sustainable coast (Rennie et al., 2017). Data from the 20-year old Channel Coastal Observatory and similar observatories (NNRCMP, 2022) have

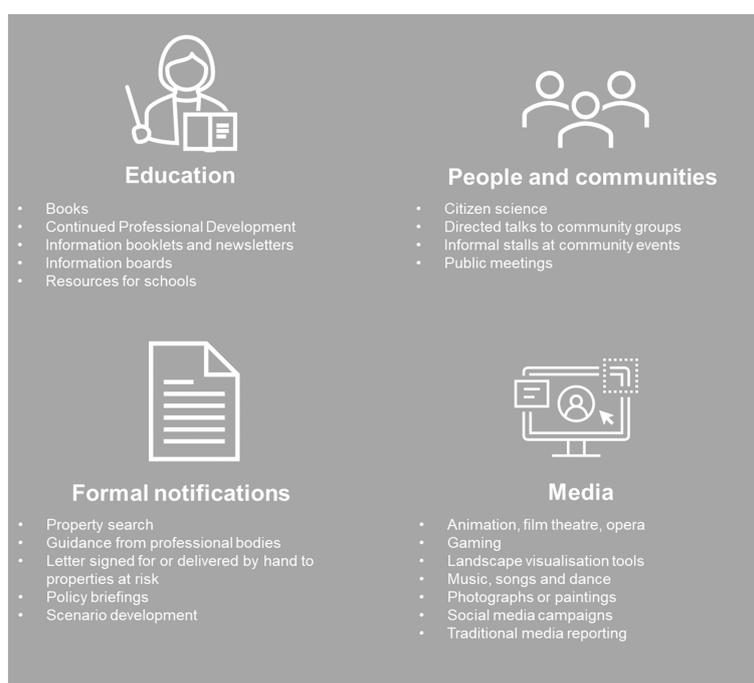


FIGURE 5

Methods of education and engagement to prepare for coastal change, based on the workshop discussions and wider literature review. These help promote awareness of the challenging issues, and embrace potential solutions.

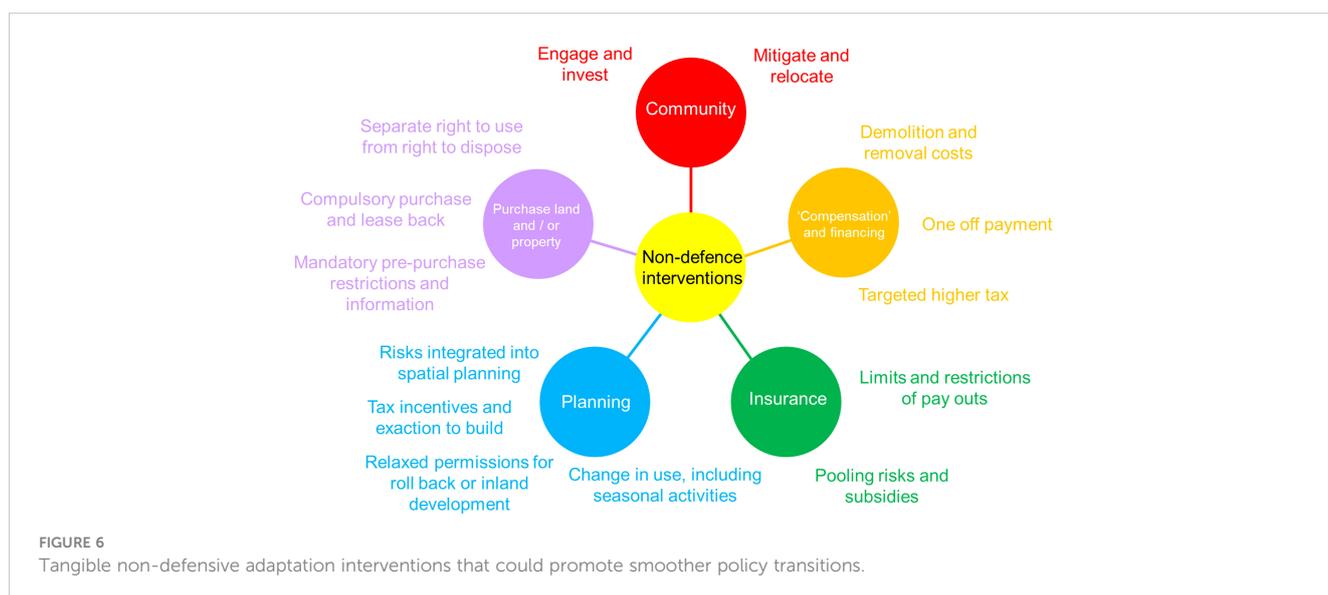
radically improved data access to much of the UK. Since 2010, the UK government has been endeavouring to make data more accessible through its open data system (HM Government, 2022). Further opportunities to improve this include “[a] better data management tool, a GIS system ... put into by a series of different agencies, so that all agencies had a proper picture, where critical infrastructure is, so there is a better tapestry and mosaics of it all together, so that you can understand people’s intentions” (NDPB-O). Greater information sharing and partnership working could support this (Environment Agency, 2020a). Ultimately multiple types of spatial data (economic, social, infrastructure, land use, planning, and coastal change) need to be integrated to deliver in an open and accessible manner to a complete picture of current and future coastal change (Lazarus et al., 2021).

5.2 Accessible evidence base and future vision to nurture political confidence in adaptation

In adapting to and preparing for coastal change, public authorities are dealing with complex risks. These risks are driven by a combination of predictable natural hazards (e.g. storms, floods), often interacting political choices and economic and social drivers. Managing these complex risks, as what Beck (1992) has described as a ‘risk society’, requires risk managers to navigate expert opinion, economic and political interests and sometimes conflicting technical interpretations of impacts on things people care about, such as public health, local amenities, and the environment (Jasanoff, 1986). The result can be political ‘hot potatoes’ that have the potential to attract significant blame to risk managers (Hood, 2002). The institutional conflicts that arose in the creation, use and application of the Environment Agency’s Flood Maps in local planning authorities (Porter and Demeritt, 2012) provide a recent example. Improving the accessibility of the evidence base (Figure 4) can help dissipate such tensions.

Cross-party support for long term adaptation, and policy continuity over time, may be one way to deliver decisions relating to these complex risks. A relevant example where consensus is evident, is the Dutch Delta Programme (Ministry of Infrastructure and Water Management et al., 2022), which reflects a shared recognition of vulnerability. In England and Wales, this too may be seen as highly desirable: it provides long term political commitment to, and engagement with, sustainable management of coastal change. Yet both are challenging to deliver in parliamentary democracies with effective opposition parties because cross-party work generally benefits the sitting government and not the Opposition (Balla et al., 2002), and it enables the sitting government to diffuse responsibility for unpopular choices (McGraw, 1990). Further, cross-party action removes the opportunity for the Opposition to expose government actions to public scrutiny, and to present their own distinct policy agenda (Norton, 2008).

Actors repeatedly pointed out that changing management options in England and Wales was difficult due to a lack of guidance (in 2019) on how, and when, to do this, claiming that: “there is no guidance nationally on how you deliver NAI [No Active Intervention in managing the coast] ... There is no definition of when properties should be removed” (ULA-Sc). Many participants wanted greater guidance on the delivery of adaptation, especially within the planning system. Since the 2019 workshops, the Environment Agency and DEFRA (2022) have launched £200 million of investment to improve resilience to flooding (including inland floods) and coastal change, such as through investment in community infrastructure, repurposing of land, habitat creation, incentives to relocate and developing the local planning system. We compile extant adaptation interventions that deliver coastal change in Supplementary Table 2. A synthesis of these (Figure 6) reveals a wide range of options to reduce risk (other than defences). Many kinds of interventions need to be utilised (Rocle and Salles, 2018) to cope with the broad range of options to promote transitions in management policy. The meaning of NAI varies between different



places and clearer guidance, utilising the local planning system, is needed to ensure consistency and credibility.

Nature based solutions could help as an intermediate step from a hard defence to NAI, and there is a growing evidence base relating to the effectiveness of different approaches. For example, along a beach at South Milton Sands, Devon, UK, hard defences reaching the end of their life were removed in favour of regeneration of the coastal dune system (National Trust, 2023). Although the dunes were damaged by the severe 2013/14 winter storms, this was a clear example of working with nature, rather than simply doing nothing. Hence nature based solutions can be an intermediate step between hard defences and no active intervention, and buys time for other adaptation and societal acceptance.

A desire to see politics removed from planning processes on the coast was expressed by multiple workshop participants. Some proposed that politicians and councillors could stand back to “decouple politics and planning on the coast” (DCC-Sc) to permit less partisan decision making. There was an emphasis on separating decisions from election pledges to avoid “political re-election” (Anon). Opportunities exist to remove politics from decision making by having clearer pathways to enable transitions. This may include: alternative funding mechanisms, identification and development of trigger mechanisms, use of regeneration funds, using local resilience forums to plan for slow change (with some of these ideas being considered in the SMP Refresh, (Environment Agency, 2020b). The importance of communication of these pathways for transitions are highlighted in multiple recommendations by the Committee on Climate Change (2018). This includes engagement of the public, education of all affected actors at all scales, and creation of tools to help stakeholders visualise the change. This is not without cost. Thus, by allowing a politically supported vision of alternative futures and opportunities to achieve this, it helps create legitimacy and credibility to retreat (Rocle et al., 2021) found helpful in coastal retreat.

5.3 Defined, time-bound and accessible diverse funding streams

Concerns about sea-level rise have increased since the conception of the SMPs in England and Wales in the mid-1990s. Sea-level rise adds to the argument that coastal change is unavoidable and different types of funding are needed to ensure resilience in the face of it. Even though adaptation is a public good, state funded budgets to deliver it are limited (Woodruff et al., 2020). Recognising the limitations of central government funding, actors felt that greater flexibility in investment is needed so that funding should be aimed at a wider range of interventions aligning with climate change adaptation (Figure 4). This was also a key recommendation in Committee on Climate Change (2018) and also through investment for sustainable growth and environmental improvements (Environment Agency, 2020a). One participant remarked: “We would also like more funding. We have bits and pieces of funding from central government. Once the funding goes people have to pay for this cost of demolition themselves, in that case we just assume that people will do a runner and disappear” (ULA-Sc). Some actors were happy to suggest a new taxation

“maybe SMPs are the known risk zones, and maybe this could be linked to taxation [as] if you choose to live there, then you have chosen to live there” (ULA-En). Others suggested an additional parish or council tax aimed at residents (NDPB-En), and others a tax aimed at tourists (Rulleau et al. 2017), such as a caravan or sand tax. However, the last two options were found to be unpopular by other actors (NDPB-En, NDPB-Sc) and hard to implement. Inspiration can also come from the efforts of other nations. In Denmark, for example, landowners are responsible for protecting their property against the sea (after seeking permission from the local municipality), unless the coast is of national importance in which case the government will also support construction of protective works (Miljøministeriet Kystdirektoratet, 2023).

Funding to manage coastal change can be delivered by multiple actors across many scales. Examples include: the household level through expenditure on flood risk mitigation (e.g. sand bags or insurance); at the town/city council level through shoreline management spending; at central government level through post-disaster emergency funding; through the private sector via both public-private partnership funding and private sector investment in the coastal zone. Examples of a greater range of funding could be used through enhanced communication and engagement methods (Figure 5 and Supplementary Table 1) or through alternative adaptation interventions, particularly planning (Figure 6 and Supplementary Table 2).

Insurance could be an important mechanism through which to achieve more sustainable household decision making. In France exploratory work has been undertaken to consider insurance-based compensation and temporary occupancy mechanisms as a means of increasing acceptance of coastal change, and at the same time reducing the need for public funding (André et al., 2015). One suggestion was that homeowners in at-risk zones should not be able to access emergency insurance if they had been offered buy-out but had not accepted the offer. Opportunities exist within the insurance sector to prioritise (via reduced premiums or higher levels of compensation) property owners whose house is their primary residence or those who have lived in a location for a long time (Rulleau and Rey-Valette, 2017). Such initiatives could be expected to promote more conscious decision making by households about risks faced by buying or renting a home in at-risk coastal areas.

To improve transitions, adaptation needs to consider the whole community, rather than just the defence of single properties, prompting the need for collective community resilience and to think beyond silos (Townend et al., 2021). This was also politically important (as identified as a cross-cutting issue in Figure 4). Actors indicated that funding should ensure that shoreline management decisions are embedded in the planning process to ensure “you don’t just defend the area itself, you also need to support connectivity around it, infrastructure and other things” (NDPB-En). Policy transitions can lead to the identification of alternative means to adapt and even regeneration. For instance, in Margate, Kent the HTL policy allowed confidence to invest in regeneration. “In the second round of SMPs, Margate was in a bad place. But the HTL has helped regeneration. Look at it now ... it’s affluent. There is security in redevelopment and regeneration. The catalyst was HTL [hold the line]” (RFCC-O).

More work is needed to identify where other, less desirable policy change, such as NAI, can lead to similarly positive processes of private sector driven regeneration, particularly in deprived areas (e.g. [HM Government, 2018a](#); [HM Government, 2018b](#); [Department for Levelling Up, Housing and Communities & Ministry of Housing, Communities and Local Government, 2022b](#)). For example increasing beach width after defence removal and creation of ecodistricts, could increase tourism ([André et al., 2016](#)) and promote environmental values ([Henderson, 2018](#); [Rocle et al., 2020](#)). This might allow coastal areas to maintain or enhance their attractiveness during periods of change ([Rulleau and Rey-Valette, 2017](#)). Where no other options exist ([Supplementary Table 2](#)), central government may need to absorb local economic losses in order to minimise coastal blight. An integrated strategy that brings together multiple funding mechanisms is most likely to deliver consistent support, to reassure the private sector, so that transitions are able occur.

6 Discussion: planning for coastal change and policy transitions

SMP2 remains “aspirational” (A-Sc, DCC-En, NDPB-En, Ps-Cn, ULA-Sc) due to lack of funding and political will to change. Much more needs to be done to address the implementation of non-defence measures. This paper has explore some practical steps that could contribute towards this goal. Detailed planning is needed to construct infrastructure (e.g. [HM Government, 1990](#)) and it would seem reasonable to apply a similar level of preparation in the removal of infrastructure. Our analysis indicates that if it is to accomplish the transition from protection to policies of either realignment or no active intervention, shoreline management planning needs to be more explicitly embedded within spatial planning. This should include consideration of a cessation of investment in infrastructure, so that contentious asset losses are minimised. Simultaneously, communities need to be ready for change, with place-based attachment (including established bonds within the community and sense of place) more widely recognised across different sectors ([Environment Agency and Flood and Coastal Erosion Risk Management Research and Development Programme, 2023](#)). Crucially, this requires education of planners, counsellors/politicians as well as those living on the coast. Presently, the implications of coastal change are not widely accepted within the affected communities and increased awareness is needed to make it more commonplace ([André et al., 2015](#)). Local decisions are often made on the basis of economics alone ([Robert and Schleyer-Lindenmann, 2021](#)), rather than risk to the property and activities of individuals. If the national government increases its share of its financial burden of risk, this may enable greater acceptance of contentious policy transitions where these are required.

Academic studies have tended to compartmentalise the psychologies and physical geographies of coastal change ([Moser, 2013](#)), but these need to coalesce around the complex issues addressed here. When policy change is contentious, there has been a lack of understanding, preparedness and thus acceptance as to why change is needed. The need for significant shoreline

management policy transitions will inevitably grow. Education, engagement and visualisation are needed for experts and non-experts alike to prepare for and accept coastal change, so that when shifts in policy become necessary contention is minimised. Planning is a crucial element of this. Communities need more inclusion in local decision making ([Hügel and Davies, 2020](#); [Martinez et al., 2020](#); [van der Plank et al., 2022](#)) and a crucial aspect of their engagement with these processes is more explicit recognition of place-based attachments ([Süsser, 2018](#)). Herein lies the implied paradigm shift: to engage we rely on past feelings about the coast, but simultaneously we need to shift our perspectives to an adaptive future.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary Material](#). Further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Faculty of Environmental and Life Sciences, University of Southampton (ethics number 48389). The participants provided their written informed consent to participate in this study.

Author contributions

SB, ET, NS, JF, IH, EL, RN, EP-R, CT and IT designed the questions and content of the workshops. All authors attended at least one workshop. SB, ET and NS analysed the data. SB and ET wrote most of the paper (with ET leading on [Supplementary Table 4](#)), with contributions from all co-authors. All authors contributed to the article and approved the submitted version.

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University of Southampton in 2019, ethics number 48389. SB undertook most of this work at the University of Southampton, where she remains an academic visitor. It does not reflect the views or positions of subsequent organisations to which she has moved.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be constructed as a potential conflict of interest.

Note that SB undertook most of this work at the University of Southampton, where she remains an academic visitor. It does not reflect the views or positions of the subsequent organizations to which she has moved.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fmars.2023.1153134/full#supplementary-material>

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