A role for the public in the long-term management of English coastal flood risk?

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**Abstract**

The widely accepted flood risk management (FRM) doctrine acknowledges that measures such as control, accommodation and adaptation should constitute part of flood preparedness. We do not know the process and extent to which FRM through insurance, planning and engineering collectively manages coastal flood risk at a sub-national level in England. Therefore, this paper analyses the challenges to integrating these policy approaches to coastal FRM locally in England.

Interviews in two regions with key stakeholders (*n* = 45) covered the costs, timing, power, responsibility, acceptability, equity, and effectiveness of FRM. Results from a thematic analysis of responses indicate challenges around the local integration of coastal FRM are long-term management and public participation.

Respondents across insurance, engineering and planning suggested that England’s national and local policies for coastal areas lack a long-term, shared, achievable and resourced vision. Funding policies prioritise individual soft and hard engineering schemes, making it difficult to obtain long-term government funding for managing the choice to accept or retreat from coastal flood risk. Stakeholders suggested the “public” should be more aware and involved in coastal FRM, but in both case study areas there were limited examples of ongoing long-term strategies to engage the public.

The results suggest an absence of a holistic, adaptable, future vision for England’s coasts where planning and other FRM approaches are combined, and a continued absence of the public in the decision-making process. Without support to actualise long-term adaptation plans and engage the public in that process, it is likely that non-defence coastal FRM options may continue to struggle to be realised.

*Keywords: adaptation, stakeholder engagement, coastal flood risk management, awareness, responsibility*

# Introduction

Projections of increased population growth in low elevation coastal zones and sea-level rise drive an increase in flood risk, including flood frequency, the number of people exposed, and financial losses [18, 29, 43]. In England, coastal flooding is estimated to contribute 30% to total expected annual flood damages [1], and 2.3 million people occupy the coastal floodplain (CCC 2013). Coastal flooding regularly features on the National Risk Register of Civil Emergencies (Cabinet Office 2017).

The flood risk management (FRM) doctrine acknowledges measures such as control, accommodation and adaptation in preparing for floods, and is now widely accepted in England and internationally [5, 11]. Its principles have increasingly been incorporated into coastal planning; in the 21st century the English and Welsh coastlines have been managed through regional-scale non-statutory Shoreline Management Plans (SMPs), which indicate engineered policy options over three epochs covering a 100 year period for the first 20 years, next 30 and final 50 years.

Policy suggests there are roles for diverse sectors such as insurance, engineering and planning to undertake in coastal FRM in England (see Table 1), but we do not know the extent to which FRM through insurance, planning and engineering collectively manages flood risk at a sub-national level in England. This study analyses the challenges to integrating these policy approaches to coastal FRM locally in England.

Table 1   Key FRM policies and legislation in England

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| **Law / policy** | **Details** |
| *Flood and Water Management Act (2010)* | Legislates national and local institutions’ duties to manage flood risk. Developed from the Pitt Review (2008) recommendations, on lessons learned from floods of the summer of 2007 (non-coastal).  |
| *Water Act (2014)* | Established reinsurance company Flood Re, mandated to “promote the availability and affordability of flood insurance” and manage “the transition to risk-reflective pricing” for households. |
| *National Planning Policy Framework (2012, 2018)* | Stipulates development should be directed away from areas at risk of flooding. Where floodplain development is necessary, it should be made safe for its lifetime (and meet sequential and exception tests). |

# Area descriptions

To record stakeholders’ expectations of the public in coastal FRM, a case study method was used. Case-based research allows for the exploitation of cases of FRM being implemented in more than one context, and the subsequent identification of features for further analysis, either in the same areas or beyond [27]. The two cases were selected from a shortlist of English coastal areas (as they share the same national legislation and public bodies), which have a variety of coastal flood risk (urban/rural, diverse industries, natural and engineered coastlines, socio-economic characteristics), and that are recorded as having experienced a flood since 1916 [17].

The north-west case area covers the Lancashire and Cumbrian coastlines, and the south case area includes Hampshire, Dorset and the Isle of Wight: see Figure 1. The north-west case area includes both densely-populated urban areas such as Blackpool and Fleetwood (where in 2015-2021, ~£120 million will be invested on coastal protection schemes), as well as rural communities of the Fylde Peninsula. The south case area similarly has both densely and sparsely populated areas, and parts of the populated coastline are subject to regular beach management works, such as beach replenishment at Bournemouth, and the maintenance and replacement of groynes [22].



Figure 1 A map of England, highlighting the case study sites in different parts of the country. The north-west and south cases are highlighted, and labelled with the multiple counties which they encompass.

Both cases have a long history of coastal flood defences, including legacy assets such as seawalls and groynes, but also sparsely populated stretches with reduced contemporary spending. These case studies provide a snapshot of local coastal FRM in England, and allow for comparison of responses of two regions experiencing particular environmental, social and economic conditions.

# Methods

## Data collection

Forty-five interviews were undertaken in May-October 2018 with key stakeholders (those with significant importance and influence) in the two case study areas. The sampling method was purposeful and interviewees were selected based upon their anticipated richness in contribution to the research aim [35]. Snowballing also took place, where stakeholders recommended by interviewees were invited to take part in this research.

In-depth, semi-structured interviews provide a flexibility between stakeholders, but the maintenance of a structure for comparability [15]. Topics discussed were based off Tompkins, Few and Brown [42] and included: costs, timing, power, responsibility, acceptability, equity, and effectiveness. Interviewees included representatives from Local Authority planning and engineering departments, the insurance industry, interest groups, local (community) groups, and landowners. Overall, 17 stakeholders were interviewed from the north-west, 17 from the south, and an additional 11 national stakeholders who were recommended by local respondents.

## Data analysis

The interview data was analysed through thematic analysis: an iterative process of theory- and data-based coding and analysis (as laid out in Fereday and Muir-Cochrane [12] and Nowell et al. [30]). The theory-based codes and themes for analyses were drawn from (a) a previous literature review on the challenges to integrating spatial planning, engineering and insurance as coastal FRM in England, and (b) the issues relevant to coastal management as identified by Tompkins, Few and Brown [42] (see Section 3.1). The codes were revised after testing with colleagues and again following the first round of coding, which used theory- and data-driven codes [39]. From the second coding cycle, a final series of themes, categories and codes were established. Two key themes are identified and discussed in this paper.

# Results and discussion

In this paper, we first focus on the theme of stakeholders’ view that “the public” needs to become more aware of their local coastal flood risk and more involved in local coastal FRM, exploring this through the second theme of developing and maintaining an adaptable and resourced holistic future vision for coastal adaptation to flood risk.

## Communicating with and to the public

Stakeholders thought the public had a greater part to play in local coastal FRM. The ideas of the public being “involved” and “responsible” are explored in Section 4.2; here we consider what basic public participation key stakeholders expect.

Public participation in hazard management is an accepted element of environmental policy, yet it remains problematic: in terms of what level of participation is being offered to communities, and whether individuals within a community are equally represented in the participatory process [13, 21]. Taking the simple yet widely cited model of Arnstein [2] on the empowerment that participation offers the public, much of the respondents’ discussions of public involvement suggest a desire for tokenistic participation.



Figure 2   Arnstein’s (1969) ladder of citizen participation. This model divides participation into three areas: the first offers little participation at all (non-participation), the second offer some tokenistic options (tokenism), and the third empowers citizens (citizen power). This study shows evidence of tokenism and some citizen power for the public in coastal FRM in two cases in England.

Adaptation for climate change is a long-term project and prepares for uncertain future circumstances; both factors complicate the role for participation of the public in coastal adaptation for climate change [13]. Local and national stakeholders reported that even simply communicating with the public about what is happening now and in the future was a significant challenge, as well as a key priority (Table 2: A, B, C).

The need to “educate” people about changing coastal flood risk, as suggested by a Local Authority planner from the north-west, resembles a tokenistic approach to participation. It exemplifies how key stakeholder goals in communication remain simplistic rather than recognising the complexities of interacting with people and providing the information end-users feel they want and need to know (i.e. information of how and when a flood may occur) [16, 36]. Yet the lack of awareness of the English public on their local flood risk, even before considering their awareness of how to be prepared, has been oft-noted [14], suggesting “educating” may not solely be tokenism, but a potentially necessary first step to achieving any further public engagement in coastal FRM.

Table 2   Stakeholder views on communicating with the public

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| Topic | Quote |
| Communication | (A) “Educating people to understand what's happening, why it's happening, and what the potential consequences are in the future.” – Local Authority planner, north-west(B) “[The challenge] is going to be convincing people the need to adapt.” – Engineering consultant, national(C) “The challenge there is communicating the risk, understanding the risk, communicating it to communities, and planning how to adapt. Those steps aren't generally being done. Generally it's seen as in the longer-term. And in the "too difficult" box, possibly.” – Engineering consultant, national |
| Expected complacency | (D) It's a major national problem that people in communities take no notice of flooding unless they've been flooded.” – Coastal group, north-west(E) “There's lots of old families … who for generations have lived in the same house in the same street. And they say "oh yes this happens … from time to time", they couldn't understand our concern” – Local group, south(F) “People are myopic, that's why they're not informed. People choose to stay ignorant.” – Insurer, national |

Further to this assumed lack of knowledge of the public, local and national stakeholders suggested there is a degree of complacency among the public regarding that risk. Again, there appear to be multiple explanations for that perceived apathy. The first explanation is that only those who have been previously flooded take notice (Table 2: D), an argument that previous empirical research supports: experience of flooding is a significant factor in determining household adaptation behaviour to flooding [34]. The second proposes the opposite: it is those who have experienced multiple floods who take it to be “normal” and are not concerned about adapting (Table 2: E). The specific characteristics of flood experiences is only recently being highlighted as important in determining influence of household response behaviour; the severity, proximity, frequency, and recentness of experiences may have differential effects on people’s risk awareness and perceptions [3]. The third hypothesis has the least trust in the public, suggesting their ignorance is a choice (Table 2: F). However, this overlooks the poor past communication of flood risk in England (i.e. use of confusing terminology such 1-in-100-year flood events) [4], and the effects past interventions such as seawalls may have on today’s residents’ perceptions of their own flood risk [24].

## A responsible, adapting public

While the focus on “communicating to” the public comes across as largely a non-participatory approach to engaging the public, local key stakeholders described further participatory roles for the public to play in coastal FRM. These include the public recognising or accepting greater personal responsibility for coastal flood risk, and undertaking household-level adaptation to that risk.

Stakeholders from coastal groups and Local Authorities shared the view of national FRM policy recommendations that the English public should take greater responsibility for their own flood risk [26, 33]. There seem to be multiple understandings of whether the issue is to communicate existing responsibilities in coastal FRM (Table 3: A, C), or rather to encourage the public to take on greater responsibility (Table 3: B). Again, however, the expectations of the local stakeholders in Table 4, A-C, are suggestive of the need for a one-way engagement with the public to increase participation, therefore remaining low on Arnstein’s [2] measure of genuine participation.

Stakeholders proposed household adaptation as an appropriate approach for individuals to act upon their responsibility. Both a coastal respondent from the north-west case and a national insurer spoke positively about the role for household adaptation (Table 3: D, E). However as has been pointed out before and here by this insurer interviewee, the insurance industry remains generally disengaged from supporting resilience measures and measuring the effectiveness of household adaptation measures in return for reduced premiums deductible is difficult (Table 3: E) [41]. Furthermore, as household adaptation is not only dependent on individuals risk attitudes and threat appraisal, but also on their capacity to adapt, based on personal, geographical and social factors [3, 44]; any emphasis on household responsibility and adaptation may further embed existing socio-economic disadvantages in coastal towns.

The offer of individuals taking on more responsibility and action suggests there might be more than tokenistic participation on offer to the English public exposed to coastal flood hazards. However, the framework to achieving that increased responsibility is largely non-existent. Individuals in the UK remain largely disengaged from FRM [10], there is little known globally on how responsibility in coastal adaptation can be most effectively framed and communicated to households [23], and there do not appear to be long-term, resourced approaches in England to engaging affected stakeholders and households [38] (Table 4: A). Barriers to household adaptation to flood risk in the UK have been previously identified to lie at three key points: motivation, access and assess information, and take action [31]. Thus, despite significant work into increasing flood risk awareness in the UK [8], this study suggests that local key stakeholders feel unsupported in the endeavour to increase public responsibility, and that there is much to be done in engaging the public through strategic and effective information provision.

Table 3   Further participation of the public in coastal FRM

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| Topic | Quote |
| Responsibility | (A) “Communication with the public, and who's responsible for what.” – Local Authority engineer, south(B) “Encouraging people, businesses, families, communities to take greater responsibility for their own resilience” – Coastal group, south(C) “A landowner may not be aware that an asset is actually theirs … Properties obviously change hands quite often. Somebody may have known about it; that may or may not be the person now, when you come back to them.” – Engineering consultant, national |
| Household adaptation | (D) “You can get flood resilience measures, flood gates, stuff like that... Resilience building, stuff like that. Trying to get communities aware of the flood risk, and take ownership of that as well. And improve their properties.” – Coastal Group, north-west(E) “Higher level that is what it means. There's all this work going on at the minute to raise the awareness of that [flood resistance and resilience measures] in the insurance market, get underwriters to understand the benefits of customers who've had flood resistance and flood resilience measures carried out.” – Insurer, national |

## Limited policy choices for stakeholders

The results above imply key stakeholders are only interested in tokenistic public participation in coastal adaptation, limited to raising their awareness and responsibility. However, this overlooks the barriers the stakeholders themselves face in engaging the public in long-term coastal FRM.

Despite the presentation of four essential choices in long-term coastal planning through SMPs, stakeholders in the south and nationally recounted that there is little policy supporting choices that are not about maintaining defence standards. In England, 550km of coastline needs to be realigned by 2030 (from a baseline of 2000) to meet SMP targets; this would require a five-fold increase in the managed realignment rate from 2000-2012 [38]. Yet, as a public body stakeholder from the south points out, other than for the creation of intertidal habitat (i.e. not per se for flood risk reducing purposes) there is little funding support for managed realignment as a policy option (Table 4: B).

Further to this, while SMPs recognise the need for retreat as a management option (“managed realignment”) the idea of relocating a community may run contrary to sustainable development policy [9, 20] (Table 4: C). Not only are the policy and funding options for non-defence adaptation choices being experienced as limited at the local level, but despite stakeholders wishing to engage the public in non-defence options, multiple stakeholders felt little policy support for that engagement process (Table 4: A, C). SMPs describe a breadth in policy options available to local key stakeholders that they are not themselves experiencing as practicable.

Despite SMPs, the short-termism of policy and funding alike was considered another limiting factor on longer-term coastal adaptation, and of an adaptation that could be inclusive of communities. In the north-west case, the focus on the immediate two decades was expressed by Local Authority respondents as being both an issue in political visibility (Table 4: D) and in the enforcement of policy (Table 4: E). In the south and nationally, the issue was perceived again to be around support for SMP policy choices that are not to maintain current defence standards, and struggling to find funding for adaptation options that are not to “defend” (Table 4: F, G). This latter barrier suggests a fundamental issue with the execution of the FRM framework: although the concept of *managing* flood risk rather than only seeking to *reduce* it is now widely accepted in policy and literature [5, 7, 8], is it also being politically and financially supported?

There is a strong body of literature on managed realignment in the UK [37], especially regarding realignment for environmental purposes but also on public perceptions and willingness to pay [25, 28], and on the potential for urban managed realignment (i.e. on the Thames) [40]. However, the literature on *relocation* of existing households, communities and even villages in England is minimal, suggesting that there is currently a political and intellectual hiatus on retreat of population as an adaptation policy option (for work on relocation at a global scale, see Hino, Field and Mach [19]).

Table 4   Limited policy choices and support for public participation

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| Topic | Quote |
| Limited policy, for engagement, relocation and realignment | (A) “The adaptation discussions require engagement, long-term engagement by probably someone local on the ground who can develop relationships. These people aren't there. They don't have the time and resources to invest in that level of engagement.” – Engineering consultant, national (B) “Managed realignment for tidal flood risk areas is a question of moving back… There's not a very good funding mechanism currently to pay for that, other than to create intertidal habitat, which isn't the answer everywhere. How can we set up a fund where - Holding the Line is often the least appropriate solution, but it's the only one that's fully funded?” – Public body, south(C) “‘[Relocation] is against sustainable development policies set nationally’ because they say ‘support communities’. … We're saying, ‘we can't support this, we can only support the relocation of this community or individuals’. How you go about doing that, there is no real Government policy that allows you to do this?” – Engineering consultant, national |
| Short-term focus and funding | (D) “Given we're an island, we just don't seem to have got our head around what's actually happening and what the impact it's going to have on communities… I don't think it's got the political visibility it needs.” – Local Authority planner, north-west(E) “There are very few policies that have a time-frame that look beyond 25 years or so… SMPs are pretty good… it's how you enforce them when it really comes down to it...” – Local Authority engineer, north-west(F) “The key thing that comes out of the SMPs is; your policy does not drive the funding. Policy will say "hold the line" but unless you can justify that scheme, you're still not going to get the funding.” – Local Authority engineer, south(G) “If you defend, there is the availability of funding. If you do not defend, there is no established funding for how you go about not defending somewhere.” – Engineering consultant, national |

# Conclusion

This study analyses the challenges to integrating insurance, engineering and planning approaches to coastal FRM locally, and finds two key challenges across these sectors are (1) public awareness and engagement, and (2) developing an adaptable, resourced, and holistic future vision for areas coastal FRM in the face of socio-economic and climatic changes.

Whilst the study focuses only on two coastlines of England, it suggests that despite work by national institutions on increased awareness and communication with the public on flood risk [6, 32], in these locations stakeholders remain sceptical of achieved increases in either. This study highlights the importance of engaging and including local stakeholders in participatory efforts for the public also; if local stakeholders remain sceptical of public ability to be included in coastal FRM, the opportunity for collaboration is insecure. One way to encourage such interaction is through improved policy and resourcing support for long-term engagement of the public by local key stakeholders.

The need for long-term, holistic and adaptable coastal plans and for public involvement in coastal FRM were highlighted in both case areas and across stakeholders; yet support for realising these goals are absent not only for each in its own right, but also for integrating the two and creating inclusive adaptation plans. The arrangement of managing coastal flood risk beyond solely coastal defences is recognisable across other countries too, albeit with differing levels of planning restrictiveness, funding and defence standards for engineering, and public-private balance of insurance. If non-defence centred coastal flood risk adaptation is to be realised in England or elsewhere, these case studies suggest long-term policies alone will not achieve that goal; further support such as through resource allocation is needed to develop plans such as SMPs into practicable realities, and to meaningfully engage the public in the adaptation process.

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