Delivering more inclusive public participation in coastal flood management: a case study in Suffolk, UK

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Abstract

Ongoing problems achieving local population acceptance of coastal flood strategies threaten their implementation. A lack of meaningful engagement by all elements of potentially affected populations is seen as instrumental in this problem. This research assumes that multiple discourses exist on involvement with flood management, but that most are not engaged in decision-making. The aim is therefore to identify, and develop an approach for engaging with, all discourses related to flood management decision-making. Q methodology and follow-up interviews were used to identify both discourses and issues with current engagement strategies related to involvement in flood management in a case study population, controlled to allow for potential bias subject to the validity of the information deficit model, based in the Alde and Ore Estuary, Suffolk, UK. The five discourses included people who are knowledgeable; politically aware; sceptical and pragmatic; sceptical and locally attuned; and engaged or disengaged; in their perspectives on flood management. A workshop was subsequently held to identify engagement strategies that could engage with all discourses. Involvement of participants representing the range of existing discourses is argued to be necessary to lead to effective recommendations for more inclusive engagement approaches.

Key words: Coastal and estuarine flooding; Hold the Line; public participation; Q methodology; Discourse analysis

1. Introduction

A major problem with the estuarine coastline of Suffolk, a county in the south east of England, in the United Kingdom (UK), is its ongoing vulnerability to flooding from the sea. If severe weather conditions occur such as those that can create storm surges, and these are accompanied by high tides, there is potential for increased flood damage, above and beyond that due only to sea level rise in the short term (Hulme et al 2002, UKCP 2009). However modelling predictions of weather and tides cannot forecast with any certainty when these phenomena will occur, and what their magnitude might be (Hulme et al 2002). It is when storm surges in the North Sea coincide with strong northerly winds and high tides that the worst effects of flooding have been felt on the south east coast of England. The most notable flood in the last century occurred in 1953 (Waverley 1953). These floods led to considerable loss of life and property, and ultimately to the construction of sea and river wall defences designed to prevent flooding from events of a similar magnitude. With maintenance, the defences have essentially held since that time (Thomas 2014). This demonstrable success of an engineered solution in response to a natural disaster helps to explain a preference, held by many local people in coastal flood risk areas of Suffolk, for a policy of 'Hold the Line' (that is maintain the position of the post 1953 flood defences and the maintenance of river and sea wall defences).

In England, the Environment Agency (EA), under guidance from Defra (The Government Department for Environment, Food and Rural Affairs) proposes strategies that must also be informed by non-statutory Shoreline Management Plans (SMPs) (devised in 1993) for protecting the coast and estuaries from flooding. SMPs are based on a division of the English and Welsh coastline into eleven cells to: improve understanding of coastal processes; predict the future evolution of the coast; identify assets that could be affected by coastal change; encourage research and monitoring of coastal processes; and facilitate consultation between groups with an interest in the shoreline (Potts 1999). In 2003 a change in an area of SMP1 covering Orfordness in Suffolk was recommended from the maintenance of a coastal defence (the 'Hold the Line' strategy), to one involving re-alignment of defences (allowing controlled areas of flooding). The change was proposed by the EA based on the argument that the costs of defending mostly farmland, by maintaining or improving the estuary and river walls, far exceeded the value of assets protected. This led to an increase in the activity and formation of action, pressure, and local management groups, some of which were operating outside the existing consultation processes of Local Government Plans and EA Strategies (Andren 2004; Green 2007; Boggis 2008; Henderson 2012). At this time it became clear in the Alde and Ore Estuary area of Suffolk that without an adequate relationship between policy makers (in this case the EA) and some individuals and groups of local people, policies could not be enacted or were significantly delayed. Thus meaningful engagement is critical if plans are to be accepted and implemented, and this research seeks to understand how this can better be achieved.

Meaningful engagement in environmental decision-making is mandated through the EU Directive on public participation in environmental decision-making (European Parliament and the Council of the European Union 2003), which is itself based on the UNECE Aarhus Convention on access to information, public participation in decision making and access to justice in environmental matters, which applies to any plans or programmes relating to the environment (UNECE 1998). Whilst the effects of Brexit (the UK withdrawal from the European Union) on environmental legislation has yet to be seen, it could be assumed that since the UK has ratified the Aarhus Convention, which is independent of the EU, the need for involvement of the public will still be recognised (Bond et al 2016).

Planning for more meaningful engagement has also been advocated by Renn et al (1995) and Cleaver (2001), who thought that participation was intrinsically a good thing. Research by Webler and Tuler (2006 p699) concluded that "*knowing what people think about participation and knowing what people want from public participation is essential in crafting a legitimate and effective process and delivering a programme that is viewed as meaningful and successful*". The research by Webler and Tuler (2006) and later Simpson et al (2016) used Q methodology to identify more meaningful approaches to public participation. This methodology was also used in this research as it reveals social perspectives (Webler et al 2003) through the identification of discourses associated with particular issues (Webler et al 2001).

The underlying premise is that meaningful engagement needs to address all discourses if it is to be successful.

However, the intent behind the Public Participation Directive is difficult to achieve in practice as agencies struggle to include all those who could be affected or need, or want, to be informed of flood risk and management. An example of this difficulty in post SMP1 changes was seen in 2004. The EA were in the process of developing estuarine strategies for the whole of the Suffolk Coast that included the Alde and Ore estuary. However some local people found the EA strategy unacceptable as it only offered engineering solutions. This stalled the strategy in 2006 in its consultation phase because the options offered did not take into account environmental, economic and social considerations. The response of some local people in the Alde and Ore Estuary and Suffolk Coastal District Council (SCDC) area has been to form a management group, the Alde and Ore Estuary Partnership (AOEP). The AOEP is made up of both statutory members (EA, SCDC and Natural England, the statutory body tasked with nature conservation in England) and other non-statutory representatives (such as the Alde and Ore Association, Suffolk Coast and Heaths Unit and local landowners). Therefore some of the group can make policy decisions and others give advice. However not all local people have either the motivation or the opportunity to participate by belonging to this group. There will therefore be people in the area who, despite facing equivalent risk, have very different levels of engagement in the development of flood management strategies which affect them.

One of the reasons for different levels of engagement in flood management decision-making was thought to be the knowledge local people had about flood management. This was recognised by an EA Officer who operated locally to the Alde and Ore estuary area at the time and was tasked with devising inclusive strategies. He thought that local people lacked the knowledge of flooding and its management and would therefore find it difficult to initially engage in flood management decisions (Steen 2009). This reflects the 'information deficit' model (Agyeman and Angus 2003; Burgess et al 1998) which argues that lack of knowledge affects understanding and behaviour (Miller 2001; Dickson 2005). The information deficit model is not uncontested; the fact that people have a lack of adequate knowledge about science (Sturgis and Allum 2004; Dickson 2005), in this case flooding and flood management, cannot always be solved by simply providing scientific information, as the model suggests (Miller 2001, Dickson 2005). Research into barriers to individuals' engagement with climate change by Lorenzoni et al (2007) did identify the lack of individual knowledge as one of the barriers to involvement in decision-making, but not the only one. Simpson et al (2016) also thought there would be different shared views, values and therefore perspectives that could influence decision making on the coast. Thus, we take the view that knowledge is still a factor that needs to be considered. It was therefore hypothesised that there would be different discourses on participation in flood management, and discourse analysis would be required as a means of identifying the diverse perspectives that exist, prior to identifying and associating appropriate engagement strategies with specific discourses. But to ensure all discourses are identified,

the population sample will be controlled for knowledge to ensure that information deficit does not bias the results and conclusions. The research aims were therefore:-

Research Aim 1

Identify the levels of knowledge about the causes and consequences of flooding and flood management and current involvement of local people in flood management planning.

Research Aim 2

Identify the discourses on participation in flood management planning using the levels of knowledge and involvement to control the population sample.

Research Aim 3

Identify preferences and recommendations for more meaningful participation in flood management planning encompassing all discourses.

2. Methodology

A case study approach can provide a contextually rich understanding that considers a number of variables, questions and responses that would be needed to fulfil the research aims (Yin 2003; Flyvbjerg 2006). The population of Orford village was used as the case study in this research because it is characteristic of many of the east coast towns and villages in this area of Suffolk. These towns and villages are similar in their population structure, location and flood risk. The village had a total population of 659 people in 2009. A significant proportion of dwellings were those occupied by holiday homes and second home owners (134 out of the 518 total dwellings in the electoral Ward), and a local population, which has always lived in the village and worked in local agriculture, fishing and service jobs. A number of the 'incomers' to many of the East Anglian towns will live in newer housing on the coast or river frontages and therefore will be more susceptible to floods. In the area of Suffolk Coastal District Council (SCDC) where these towns are located there are twice as many second homes (7819) as opposed to Waveney District Council (WDC) to the North (3769) (ONS 2011). Aldeburgh, Orford, Southwold, and the village of Walberswick, are all locations on the coast in the county of Suffolk which are susceptible to both coastal and estuarine flooding (Figure 1).
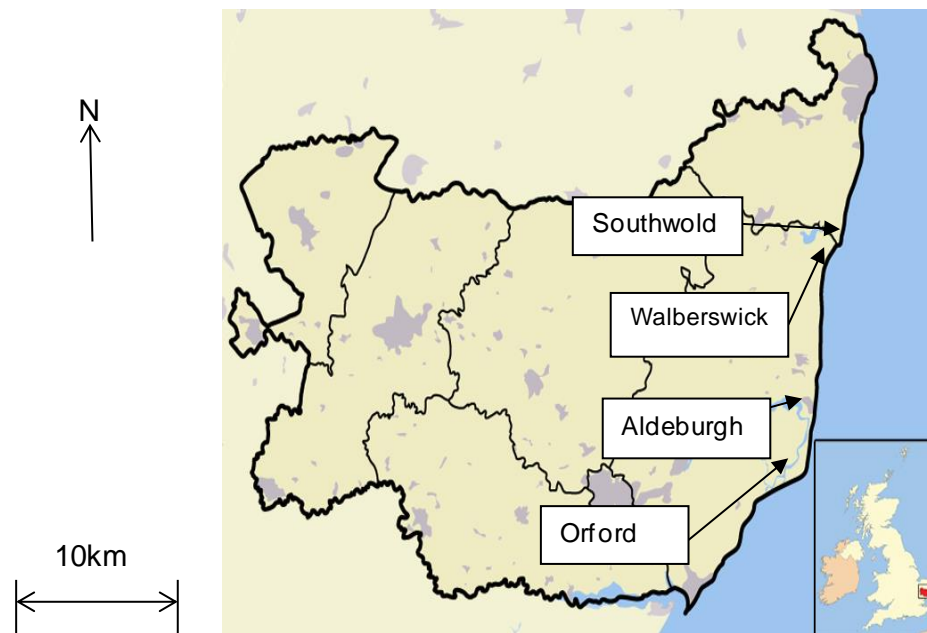
Figure 1 Map to show the locations of Orford, Aldeburgh, Walberswick and Southwold on the coast of Suffolk and the location of Suffolk in the UK.

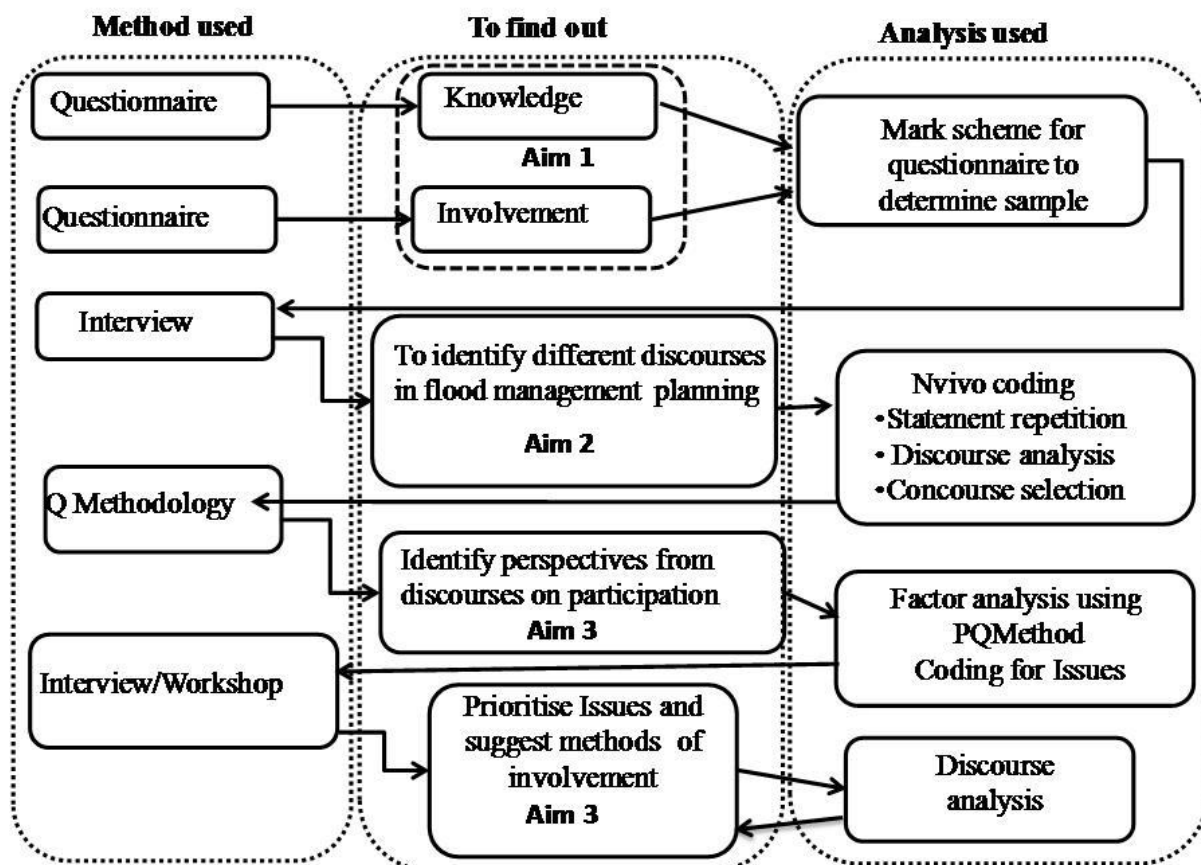Figure 2 illustrates the research design.

Figure 2 Research Design

2.1 Method for Research Aim 1 – A questionnaire to identify levels of knowledge about the causes and consequences of flooding and flood management and current involvement in flood management planning

A questionnaire approach was used because it is considered to be one of the best methods to test for knowledge through sampling a whole population (in this case 659 people living in 432 households). That is, numbers would be potentially large, and the information and answers required were from multiple choice questions and those requiring considered responses across a wide range of knowledge about flooding and flood management (Peterson 2000; May 2001). A questionnaire was designed and distributed to all households in the village; in addition copies were left in places were villagers could pick one up, such as local pubs, shops, garage, drama group, play group and recreation club. Involvement was used as a measure of participation, because it can be considered an act of participation, for example in attending meetings and belonging to organisations concerned with flooding.

Background research undertaken in 2008/2009 (IPCC 2007; Shennan and Horton 2002; Masselink and Hughes 2003; Brown 2006), identified some of the information needed to assess the knowledge that a local population possessed about the causes of coastal flooding, and how much involvement they have had with flood management. The questionnaire, which can be obtained on request from the first author, identified five categories of levels of knowledge and involvement, which was a precursor to structuring a sample for discourse analysis that would allow for more in depth investigation that controlled for the information deficit model:

High levels of knowledge and involvement	(HH)
Low levels of knowledge and involvement	(LL)
Low levels of knowledge and high involvement	(LH)
High levels of knowledge and low involvement	(HL)
No classification	(NC)

Each respondent was given a score for knowledge and for involvement based on their answers to the questionnaire. Allocation to categories of knowledge and involvement proceeded on the basis that respondents scoring one or more standard deviations from the mean were considered low (if below the mean) or high (if above the mean) for knowledge and/or involvement. Most respondents (74%), scored low for involvement and if they did not have a high enough score to be considered of high knowledge (that is in the middle range for knowledge) they were allocated to the No Classification category. Few

people scored high for knowledge and low for involvement (suggesting some, but not complete, validity for the information deficit model). Whilst the validity of the use of standard deviations relies on a normally distributed data set, in this research the calculation was used simply as a device to distinguish levels of knowledge and involvement for which any inaccuracies caused by skewed distributions was felt to be insignificant. Therefore, those scoring within one standard deviation were separately categorised (as 'no classification'). Members of all categories, including 'no classification', were also used at later stages of the research for sampling for interviews and development of the Q methodology approach.

2.2. Method for Research Aim 2 – Interviews and Q analysis to identify the discourses on participation in flood management planning using the levels of knowledge and involvement to control the population sample

2.2.1 Pre-Q interviews

A sample drawn from four of the five categories of knowledge and involvement were selected for interview in 2009 (people from the NC category were not used at this stage in the research because people with more differentiated knowledge and involvement were initially sought), with attention being given to accessing across the age distribution (1<20; 1 21-40; 5 41-60; 7 >61), and gender (there were an equal number of males to females). Semi-structured Pre-Q interviews were undertaken, and were analysed using the NVivo computer programme. The Pre-Q interviews identified problems, enablers and preferences for participation, and allowed a concourse of 40 statements to be identified that reflected the diversity of views, beliefs, ideas and concerns of the different categories of people. Both the number of statements in the concourse, and the balance between negative and positive statements, were as recommended by Q methodology experts (see Schlinger 1969).

2.2.2. Q Methodology

The concourse of 40 statements gave a representative view (based on their development from interviewees representing four categories of knowledge and involvement on the causes and consequences of flooding and flood management planning) for people to sort on a grid. The grid, after Eden et al (2005), is shown in Figure 3. Instructions, as recommended by McKeown and Brown (1988), asked the participants to sort cards containing the statements into three piles representing those most like their views, those least like their views, and a central selection of those they feel more neutral about. Participants then placed the cards on the grid for recording and analysis. The question for those performing the sort was:

What statements are most like your views or least like your views about involvement in flood management in Orford?
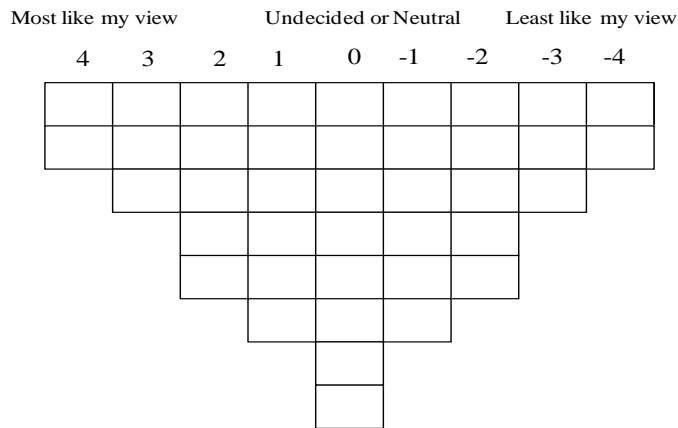
Most like my view   Undecided or Neutral   Least like my view

4	3	2	1	0	-1	-2	-3	-4

Figure 3 Q sort grid

Previte et al (2007) recommend a number for Q analysis of between 30 and 40 participants to "*reduce complexity and produce fine distinctions*". Returns were therefore not pursued after 39 sorts were achieved including people from all five categories of knowledge and involvement (five LL; eleven NC; twelve HH; four LH; seven HL). Whilst the numbers in the low knowledge categories (LL and LH) were lower, considerable efforts were made to achieve even these levels of engagement which suggested that controlling for information deficit model was a useful mechanism for ensuring the harder to get members of the community had their own views heard.

The Q sorts were factor analysed using a computer programme, PQ Method (Schmolck 2010), which enables Q sorts by individuals to show high correlations between one another (Brown 1980). The underlying assumption of the analysis is that Q can differentiate people with different discourses by identifying correlations between subjects rather than the traditional approach of identifying correlations by variables.

When the results of the Q sorts were analysed, a decision had to be made about the number of Factors to use based on the procedure outlined by Robbins and Kreuger (2000). The choice of Factors is important because it determines the ability to recognise groups of people with different perspectives (discourses). The Q sort individuals were identified as having 'defining sorts' by their loadings on Factors using PQ Method. Four, five, and eight factor distributions were considered, with five chosen given it led to the fewest overlaps of statements. Factor rotation was attempted but no gain in groupings of factor statements was justified using this technique. Readers are referred to (McKeown and Brown (1988); Robbins and Krueger (2000); Eden et al (2005) for instruction on how this works.

2.2.3 Post-Q interviews

In an attempt to be more objective when analysing the different perspectives, a sample of those identified as being representative of each of the discourses were subjected to follow up interviews in 2010. This is a step rarely conducted by researchers using Q methodology as evidenced in a review of

seven Q surveys (Eden et al. 2005; Valenta and Wigger 1997; Webler and Tuler 2006; Johnson and Chess 2006; Thomas and Watson 2002; Simmons and Walker 1999; Raadgever et al. 2008), where only one set of post Q interviews were carried out (in Johnson and Chess 2006). Interviews were therefore used to help test some of the assumptions of the Q methodology and analysis, as recommended by Robbins and Krueger (2000). That is, the ability of Q to differentiate between people with varying views, and to identify through analysis issues they may have with their participation in flood management planning. Open ended interviews were used to elicit the reasons they chose statements, as well as the ones they did not choose. In these taped discussions the main problem areas with their involvement in flood planning and preferences for methods emerged. Discussions with individuals of the outcome of their Q analysis and analysis of interviews using coding both confirmed the existence of different discourses and allowed the identification of issues with, and preferences for, methods of involvement that would be taken forward to a workshop for Q participants.

2.3 Method for Research Aim 3 – identify preferences and recommendations for more meaningful participation in flood management planning encompassing all discourses

A workshop was organised to follow the post Q analysis with the aim of determining whether there was a consensus between participants with different perspectives about the most important problems to overcome, and engagement strategies to use in engaging with flood management decision-making. Participants representing each of the five discourses were identified and persuaded to attend the workshop, although illness and late withdrawals meant that only four of the five discourses were actually represented (although all five categories of knowledge and involvement were represented). The aim was to discuss barriers to involvement in flood management, prioritise the problems, suggest some solutions and select some preferences for methods. The workshop was structured into two discussion groups to prioritise problems with involvement and to suggest local solutions.

3. Results

3.1 Results to identify the levels of knowledge about the causes and consequences of flooding and flood management planning and current involvement in flood management planning (Research Aim 1)

Figure 4 shows the numbers of respondents fitting into each of the five categories identified from the questionnaire for their levels of knowledge and involvement The return rate was 109 questionnaires from a population of 576 over 16 year olds (19%). The population is skewed to the older age groups, 169 were age 44 or under (31 under 24) and 407 over age 45. An analysis was made of all the answers to the questions to gain an insight into what levels of knowledge and involvement existed but the main use of the questionnaire was for sampling purposes.
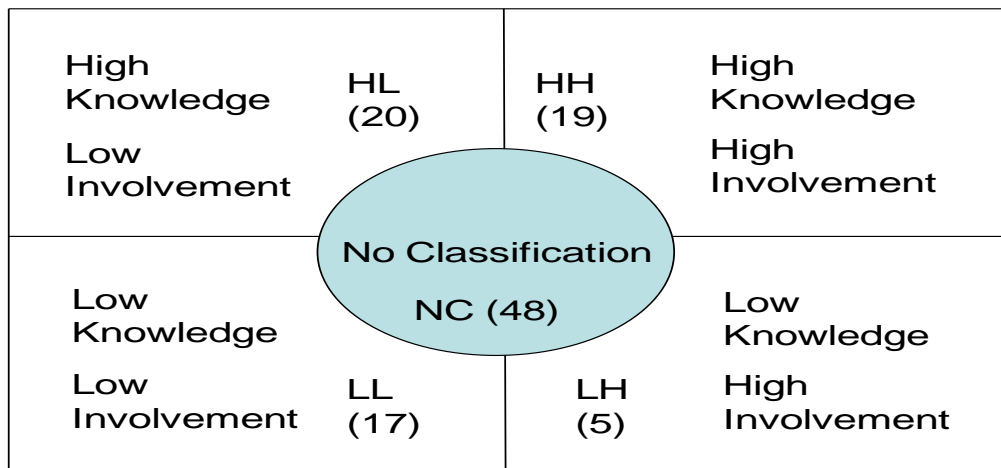
Figure 4 Five categories of Knowledge and Involvement and their respondent numbers identified in this research

3.2 Identifying discourses on participation in flood management planning using the levels of knowledge and involvement to control the population sample (Research Aim 2)

There were four HH, three HL, three LH and four LL pre-Q interviewees whose responses were taped and using NVivo, facilitated the generation of a concourse of statements. Extracted from NVivo were: 43 individual attitude statements; 30 statements about consultation and participation methods; 20 statements about governance and 15 about information issues; totaling 108 statements that were distilled into a concourse of 40.

People with no classification (NC) were not interviewed to establish the concourse of statements at this stage, as they could not be reliably distinguished from the other categories, but they were involved in Q sorting. Defining sorts were significant at SE > 0.42 which is the standard error calculated for the use of 39 participants using the formula: SE= 2.58 x1/ $\sqrt{39}$ = 2.58 /6.2 = 2.58x 0.1613 = 0.42.

After factor analysis using PQ Method, 31 out of the 39 people who carried out the Q sort had defined sorts (i.e. significantly associated with one of the factors): a participant with significant loadings on two different Factors, was excluded from the analysis, along with seven participants who did not load on any Factor. Using characteristics of the people with sorts defined by their statement selection in the five Factors, Table 1 was constructed in order of high to low scores of participants in each of them. In Table 1, the first two numbers (01-39) are the participant's number in returning the sort; the next two letters, HH, HL, LL, LH or NC, are the category of knowledge and involvement of the participant; the next letter represents the gender of the participants; and the final number represents the age of the participant: ≤20 = 1; 21-40 = 2; 41-60 = 3; ≥61 = 4. For example the code: 03HHF4 means:

03	HH	F	4
Number in sort	High level of knowledge and involvement	Female	61 years or over

Table 1 Results of the five factor selection

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
03HHF4	10NCF3	09NCM4	24LLF2	35NCM4
36HHF4	05LHM4	02LLM1	32LLF1	04HHF4
28HHM4	18HHM4	37NCM3	34NCF3	38HHM4
11HLM3	27HHM4	39HLM4	13LHF4	25HHM3
26HHF4	33HHF4	31LHM4	30NCF3	20NCM4
06HL4	01LLM3	21HLM		
07HLF4				
08NCM4				
15HHM4				

Z scores greater or lower than 1 standard deviation from the mean, as calculated using PQ method and seen in Table 2, allowed statements to be allocated of varying significance to groups of people with like views. Five groups of distinguishing statements were identified with different views on coastal flood management planning. The following factors were distinguished as perspectives:

Factor 1- A Knowledgeable Perspective

Factor 2- A Politically Aware Perspective

Factor 3- A Sceptical and Pragmatic Perspective

Factor 4- A Sceptical and Locally Attuned Perspective

Factor 5- An Engaged and Disengaged Perspective

The first Factor was characterised as a Knowledgeable Perspective because the people in this grouping had mostly high knowledge scores (see Table 1). The second Factor was identified as the Politically Aware Perspective given that three out of nine statements characterising the factor referred directly to national or local government, two to the Environment Agency, and one to the Alde and Ore Association

as a pressure group. There was also a negative response to support for the community solving problems. Table 2 shows an example of the characteristic for the Politically Aware Perspective

Table 2. A Politically Aware Perspective

Statements most like my views		Statements least like my views	
Concourse statement	**Z score**	**Concourse statement**	**Z score**
32. Central government is facing severe cash problems. East Suffolk does not return Labour MPs, so they will not spend money here.	2.2	1. I am busy doing other things.	-1.7
26. The Environment Agency doesn't feel the small number of people involved, are worth the billions that it is going to cost to save the coastline.	1.8	37. I would trust the Environment Agency not to tell lies.	-1.5
27. Local councils should be the principle agents for sea defences.	1.6	3. If it was a practical situation and flooding was actually happening, then yes I would get involved.	-1.4
29. The Alde and Ore Association are an important pressure group.	1.4	28. We need to talk to local councillors more.	-1.1
		23. When it comes to community things people have always helped each other and we don't need to have it written down.	-1.1

Scepticism about the effectiveness of politicians, scientists and decision makers were evident in both Factors 3 and 4. Those loading on Factor 3 had a preference for selecting pragmatic statements such as personally responding to a flood event, and those loading on Factor 4 had a preference for listening to and finding out more from local people. People loading on Factor 5 were divided into those who loaded negatively and those who loaded positively. Negative views were identified in those who were disengaged and had no direct involvement in flood management planning and the other responses were from a more organisational and 'engaged' view. Table 3 shows the main characteristics identified in each of the five Factors.

Table 3   Characteristics of the Five Factors

Factor Perspective	Main Barriers	Motivations implied	Improvement possibilities	Knowledge Involvement	Gender	Age

Factor1. A Knowledgeable Perspective	Lack of honesty	Personal interest, confident and has time	Quality of information	High Knowledge Mixed Involvement	4 Males and 6 Females	41-60 and ≥61
Factor 2. A Politically Aware Perspective	Lack of funding and trust and not practical	Has time	Local Councils and pressure group used	Mixed Knowledge Mostly high Involvement	3 Males and 3 Females	41-60and ≥61
Factor 3. A Sceptical And Pragmatic Perspective	Lack of honesty and trust in scientists and politicians	A practical situation to respond to	Good, possibly technical information	Mixed Knowledge more low Involvement	7 All Males	≤20, 41-60and ≥61
Factor 4. A Sceptical And Locally Attuned Perspective	Cynicism of politicians Nothing happens	Local sources of information. Aural possibly preferred	More debriefings (feedback)	Mostly Low Knowledge and Involvement	5 All Females	All age groups
Factor 5. A Disengaged Perspective	Lack of support for EA. Decision has been already made	Interest in the river	Join the Alde and Ore Association pressure group	Mixed Knowledge and Involvement	1 Male 1 Female	≥61
Factor 5. An Engaged Perspective	Lack of funding	Trust in the EA Support for Alde and Ore Association	People should write and protest more Write to councillors	Mixed Knowledge and Involvement	3 Males	41-60 and≥61

Table 3 shows that high levels of knowledge about the causes and consequences of flooding and flood management planning determined by questionnaire results were found in those who loaded on Factor 1, low levels of knowledge were found in Factor 4, and low involvement was found for participants in both Factors 3 and 4. Thus those people loading on Factors 3 and 4 may provide valuable suggestions for greater inclusion and some improved participation in flood management planning. A common loading for both high and low knowledge people was on Factor 2, the politically aware perspective. Further research may bring out differences but from the findings of this research it would suggest that participants with higher levels of knowledge about the causes and consequences of flooding and flood management planning were more engaged with national issues whilst those with less knowledge engaged more with local government and were more sceptical of national government.

People from the younger age groups ($\leq$20) were few in number but exclusively found in Factors 3 and 4, which classified them as sceptical and either pragmatically or locally attuned. The two young men were placed in Factor 3, and the young woman in Factor 4, which may suggest a gender and age preference between these Factors (particularly as all those who loaded on Factor 3 were male and all those loading on Factor 4 were female, irrespective of age), although a much larger sample would be needed to verify this. There appeared to be a preference for those who loaded on Factor 3 to favour practical involvement and to choose Statement 3 which said "If it was a practical situation and flooding was actually happening, then yes I would get involved". In contrast those who loaded on Factor 4, and were female, had a preference for Statement 31 that said "I get information about flood management from local people. I would listen to someone who had lived here all their lives, and worked on the river". People who loaded on Factors 3 and 4 selected the highest number of statements about information. These preferences show that different perspectives exist and therefore involvement strategies may need to be varied in order to enhance participation across all discourses. Further research was therefore carried out to investigate what the different strategies could be.

3.2.1 Post Q Interview Results and Discussion for identifying issues with participation in flood management.

Post Q interviews findings were used as the basis for method preference selection at the workshop. Engagement methods were classified as formal or informal. Formal are those arising as a result of deliberate decisions in organisational design (Rank 2008), and are often 'top down', an example is meetings devised by the Environment Agency. Informal methods could be self organised groups (Lesser and Prusak 2000), like the Alde and Ore Association, which is akin to a Community of Practice, whereby learning is achieved in an organisation that is promoting collective learning (Wenger 2006).

Interviews were transcribed and coded in three stages: the first to identify knowledge of, or representation by, policy, conflict, trust, and perception of flood risk issues; the second to sub code these into 18 separate issues that were finally, in stage three, distilled into 10 issues (Table 4).

Table 4 Issues with public participation in flood management identified from post Q interviews

1	Lack of trust in responsible organisations.
2	Little interest in the sea or river.
3	Lack of knowledge and awareness of flood risk.
4	Lack of trustworthy and accessible information.
5	No time.
6	Lacking in confidence.
7	Not feeling part of any community in the village.
8	Lack of funding.
9	Few practical opportunities.
10	Problems with the process of solutions and decisions.

3.3 Identifying recommendations for more meaningful participation in flood management planning encompassing all discourses (Research Aim 3)

Workshop participants were divided into two discussion groups. Each group represented a mixture of those loading on different factors in the Q sort as shown in Table 5. Illness and late withdrawals meant that it was not possible to get a representative from Factor 2 (politically aware perspective) to attend the workshop. The groups were asked to discuss the ten problems synthesised from issue identification (Table 5) and prioritize them in descending order of importance (see Table 6).

Table 5 Selection of priority problems after group discussions

	Problem ➡ F ↓	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Group 1	1,3,4	8	5	6	5	10	2	3	8	4	9
Group 2	1,4,5	ns	ns	8	ns	8	ns	ns	10	ns	9

(F = Factor perspectives in the Group; ns = no score/not selected)

(On a scale of 1 to 10, 10 is the highest scoring priority issue)

The two groups of four villagers each were asked to prioritise the issues using a score of 1 to 10 but due to time constraints were asked to prioritise their top four. Table 6 indicates that the second group only scored four main issues in the time available whereas the first group scored all of the issues; both groups gave some issues the same score. There were fewer people than was ideal for a wide range of perspectives but the workshop still included a broad representation of discourses and levels of knowledge and involvement. There was consensus in prioritising (see Table 5): Time (Issue 5) available to local people to become involved in flood management (both groups); Funds (Issue 8) to carry out flood protection (both groups); and problems with the Process (Issue 10) of involvement (both groups). Group 1 had an additional concern about Trust (Issue 1) and Group 2 for Lack of Knowledge and Flood Risk Awareness (Issue 3). These five main issues for the groups therefore became the focus for discussion as to what engagement strategies could be suggested. Table 6 lists those solutions suggested in the workshop.

Table 6 shows solution suggestions from workshop group discussions

Problem	Solution	Group
No time	A play in the village relevant to floods	1
No time	Distribute information to where local people are. Shop and garage	1
No time	EA publish a list of work in the Village Voice Parish magazine and on site	1
No time	Encourage collective responsibility. Neighbourhood watch idea	2
No time/apathy	Flood management is a dull idea for people with other commitment inference-make it more interesting. If people find it 'dull' they will not get involved	2
No time	A local film or drama	2
No time	Use time in school and produce school projects for the community	2
Funding	Investigate funding by wealthy landowners. Landowners funded their wall maintenance in the past	1
Funding	Self help by local people with power delegated from government	1
Funding	Increase lobbying of local MP by people with 'clout'	2
Funding	An East Anglian region wide co-ordinated effort	2
Funding	An extended valuation of land to include agriculture and tourism, not just people and property	2
Funding	Use local media more and local people with media influence	2
Funding	Use the Alde and Ore Association for advice and contacts	2
Process	Narrow choices to identify what people do not want	1
Process	Create feedback using local media	1
Process	Become better informed by reviewing similar situation elsewhere, like the Dutch	2
Process	Encourage wider representation like commercial groups who could be affected	2
Trust issues	Lack of knowledge about what the EA does (use information pamphlet produced for the Flower Show).	1
Trust Issues	Greater access to local government officers who form policy	1
Lack of Knowledge and	Use the Link, Parish Magazine. Have an exhibition at the Flower Show and have an Orford Flood Week to increase knowledge and awareness	2

awareness of flood issues		

3.3.1 Identification of problems and suggesting some solutions, preferences and recommendations to improve input into flood management planning (Research Aim 3).

The issue of the lack of time to give to flood management to attend meetings, exhibitions or for feedback from these events, is a recognised problem (see, for example, Ajzen 1991; Blake 1999; Webler and Tuler 2006). People who did not select 'lack of time' typically loaded on Factors 1 and 2 of the Q sort, the Knowledgeable and Politically Aware perspectives. People loading on Factors 1 and 2 felt that they were 'not busy doing other things' and so should be able to get involved. These groups favoured the Alde and Ore Association as a source of information (Factor 1) and as a pressure group (Factor 2) which meant they knew of, or belonged to, this organisation.

To address the lack of time issue it was felt that the agencies should engage with local populations in ways that would take information to the people. This was especially relevant for those loading on Factor 4, where people preferred finding out from local sources, for example village shops, garage, pubs or other frequented places. More effort to provide information of the work in progress of the Environment Agency at local sites was also suggested as a suitable means of engagement at the workshop; for example site specific explanations on boards.

The EA was criticised for making 'dull' presentations, so it was acknowledged that the manner of presentation of information was also important. Associated with this was a request for more inventive methods such as film and drama, which could be used to spark interest in the problems the agencies are trying to solve. Reference was made to a local film produced in 2013 with the input of local people and a professional film producer who had recently moved to the area. Other ways suggested to involve local people included participation in practical projects. These were favoured by Factor 3 participants, such as 'active neighbourhood watch' type schemes that have already been undertaken in the Alde and Ore river area by members of the Alde and Ore Association. Interested local people carry out inspections of the condition of the river walls and report these to the EA (Bettinson 2011). The EA has accepted the data and encourages its production. Awareness and help with flood protection planning is also a way to foster inclusion, and is encouraged by local councils.

There were seven solutions suggested to a perceived and actual lack of funding. There is therefore an awareness of the need to engage with a search for other funding sources, possibly through local fund raising and self-help solutions. Lack of funding to carry out river defenses in the area was, and still is, a recognised problem, where government funding is prioritised to areas where there are more assets to protect (i.e. not the case study area which is rural in nature). There was thus an understanding that funds

would have to be raised locally. In the UK funding for flood defences is permissive, spending on maintaining river and sea walls often has to be weighed up against other demands, such as education and health (NNDC 2012), and there is more suggestion that local communities should contribute to coastal defence (NVCC 2011). A suggestion was to increase local lobbying of politicians to highlight the need for increased local funding by using the local press and the media in general, to include petitioning and writing letters.

Some of the participants at the workshop had been involved in the process of EA consultation in the area therefore their comments reflected their issues with the process that they felt was unrealistic, bureaucratic, progress to decisions was slow and more integration was needed. These issues were identified in post Q interviews and were thought to inhibit the process by these local people. They offered four solutions to improve the process: look to Dutch examples for solutions; introduce improved feedback; include wider involvement of, for example, commercial groups to improve integration in decisions; and the need for responsible agencies to devise better ways to include people in decision making. This could be a strong argument for encouraging improved awareness and provides a challenge to the agencies responsible, when they want to present options for flood management strategies to non-expert local people.

Group One at the workshop raised the issue of being given honest and trustworthy information as a priority. To overcome a lack of trust it was felt that the EA's roles and aims ought to become more widely known, and the use of local events, such as village shows, was suggested as a means of facilitating this. It was also suggested that local government agents, who are responsible for flood management decisions, ought to be more accessible to local people by making their names and contact numbers available. The EA staff member responsible for engagement in the Alde and Ore area at that time, made frequent visits to the area to talk to local people.

Group Two selected 'Lack of Knowledge and Awareness of Flood Risk' in their prioritising of the most important issues. They thought that use of local information sources, such as through the village flower show, schools and magazines, are suitable ways to inform and engage with more of the local community.

4. Conclusion

The research has set out to identify means of increasing the levels of meaningful participation on coastal flood management, based on the premise that current engagement approaches focus on those members of a population who share a particular discourse or discourses on flood management involvement. Whilst the research investigates a particular case study based in England, the premise investigated is universally valid, as are the methods used in this study.

Initial questionnaire survey did demonstrate that there were differences in the levels of knowledge and involvement that potentially affected communities have in relation to flood management. This initial investigation revealed that people could be categorised in terms of their levels of knowledge separately to involvement, with the distribution indicating no direct relationship between the two. That is, information deficit is not solely to blame for lack of engagement of flood management planning. This outcome was expected and in this research the analysis was conducted as a means of ensuring that the other tiered methods adopted used a cross section of the population in terms of levels of knowledge and involvement to ensure results were not skewed by any validity of the information deficit model.

Q-method was applied to identify five separate discourses in relation to flood management engagement. This makes it clear that there are key difference in the way people think about flood management and the associated governance arrangements. It is reasonable to assume that strategies to engage people sharing a particular discourse might vary from those sharing a different one. Such an assumption is underpinned by the statements selected in the Q sort that reveal, for example, different levels of trust associated with different stakeholder grouping, and different values in terms of the importance of involvement. There is some evidence that the communities of practice that have developed in terms of local associations with agendas for particular flood management outcomes have members that are restricted to a subset of the discourses identified. That is, they can be shown to be unrepresentative of the community as they fail to engage with all the different discourses that can be identified.

Post-Q interviews allowed a clearer understanding of the discourses, and verification of the nature of the differences attributed to particular statements in the Q-sort. Such interviews are rare in Q-methodology but here gave a clear indication that the discourses were significantly different and are recommended as a means of triangulating the identification of discourses. The post-Q interviews also facilitated the assembly of preferences and suggestions for engagement methods likely to be successful for people sharing each of the discourses identified.

To properly make use of the discourse analysis to highlight appropriate ways forward to better engage affected communities in flood management decision making, it is clear that all of the discourses need to be represented in planning the engagement appropriately. In this study an attempt was made to do this, although there was unavoidable absenteeism meaning that not all discourses were included. There is also a need to test the recommendations coming from the workshop in order to validate their ability to improve engagement. As such, the research did not demonstrate the effectiveness of the recommendations made in terms of actually leading to more meaningful participation in flood management decision-making.

This research has demonstrated that different discourses exist in relation to involvement in flood management decision-making, and that it is possible to identify these discourses. It would be valuable for future research to identify discourses in different contexts to establish whether there are generic

discourses common to all contexts, and to enable the development of a toolkit of engagement strategies suitable for different discourses. Without efforts in this direction, we would argue that flood management strategies will continue to bypass significant proportions of potentially affected populations.

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