

# Testing approaches to flood resilience for disadvantaged areas

A pilot to test the flood resilience for disadvantaged areas project outputs for targeting support to communities at risk of flooding

**Final Report**

**2017**

*This report was commissioned by Joseph Rowntree Foundation and delivered by the National Flood Forum. It is a contribution to part of EU Interreg FRAMES, Flood Resilient Areas by Multilayer Safety Approach*



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## *Executive Summary*

Flooding is the most dangerous and damaging natural hazard that the UK faces (Wheater, 2006). In England alone, 5.2 million properties are at risk from flooding (EA, 2009). Furthermore, the UK climate change risk assessment (UKCCRA) has identified flooding as the greatest risk to the UK posed by climate change (DEFRA, 2015). Recent natural disasters remind us of our society's increasing vulnerability to the consequences of population growth and urbanisation, economic and technical interdependence, and environmental change (Rougier et al., 2013).

Developing a better understanding of flood vulnerable communities and the risks they face is a prerequisite to delivering a socially just (i.e. fair) approach to prioritising flood risk management efforts within national policy and funding structures. It is true to say that evidence provided to policymakers has, to date, included very limited insight into flood disadvantage (England and Knox, 2015).

Research from academics such as Sayers et al (2017) identified that flood risk management policy typically considers vulnerability through the lens of deprivation (as indicated by the index of Multiple Deprivation). A focus on deprivation however does not necessarily reflect a community's vulnerability to a flood, should it occur. To overcome this short-coming they introduced two new measures; the Social Flood Risk Index (SFRI) and the Neighbourhood Flood Vulnerability Index (NFVI). The SFRI is used to identify where vulnerability and exposure coincide to create flood disadvantage. This is for both surface water flooding and river and coastal flooding. The NFVI is used to express the characteristics of an individual and the community in which they live that influence the potential to experience a loss of well-being when exposed to a flood and over which flood management policy has limited or no control.

This project has used the data from the Sayers et al (2017) report and a workshop methodology to test whether this data is a true representation of the flood disadvantage of communities on the ground, as well as testing whether the workshop methodology is a useful approach in identifying flood risk management and resilience mitigation works in such communities. The workshop methodology proved successful in bringing together partners from different sectors to discuss community flood disadvantage in both Rochdale and the Isle of Sheppey. The workshops enabled participants to share sector specific issues, share current projects that are being undertaken in communities that are tackling aspects of vulnerability and enabling cross sector projects to be developed that produce multiple benefits to a community.

However, during both workshops participants identified shortfalls with the data in truly representing vulnerability factors at the community scale. The main finding from this pilot was that decision making regarding the targeting of flood risk management activities in disadvantaged communities, should not be driven solely by data. This report has demonstrated that the approach of combining data with local knowledge and skills provides a much more informed discussion about flood disadvantage than using data alone. Therefore, this report has outlined seven recommendations for furthering the methodology used in this pilot to ensure that holistic and inclusive decisions are being made regarding the targeting of flood risk management activities in disadvantaged communities. It is thought that this refined methodology could be utilised by all sectors across the UK to identify flood disadvantaged communities and future interventions.

# 1. Introduction

## 1.1 Background

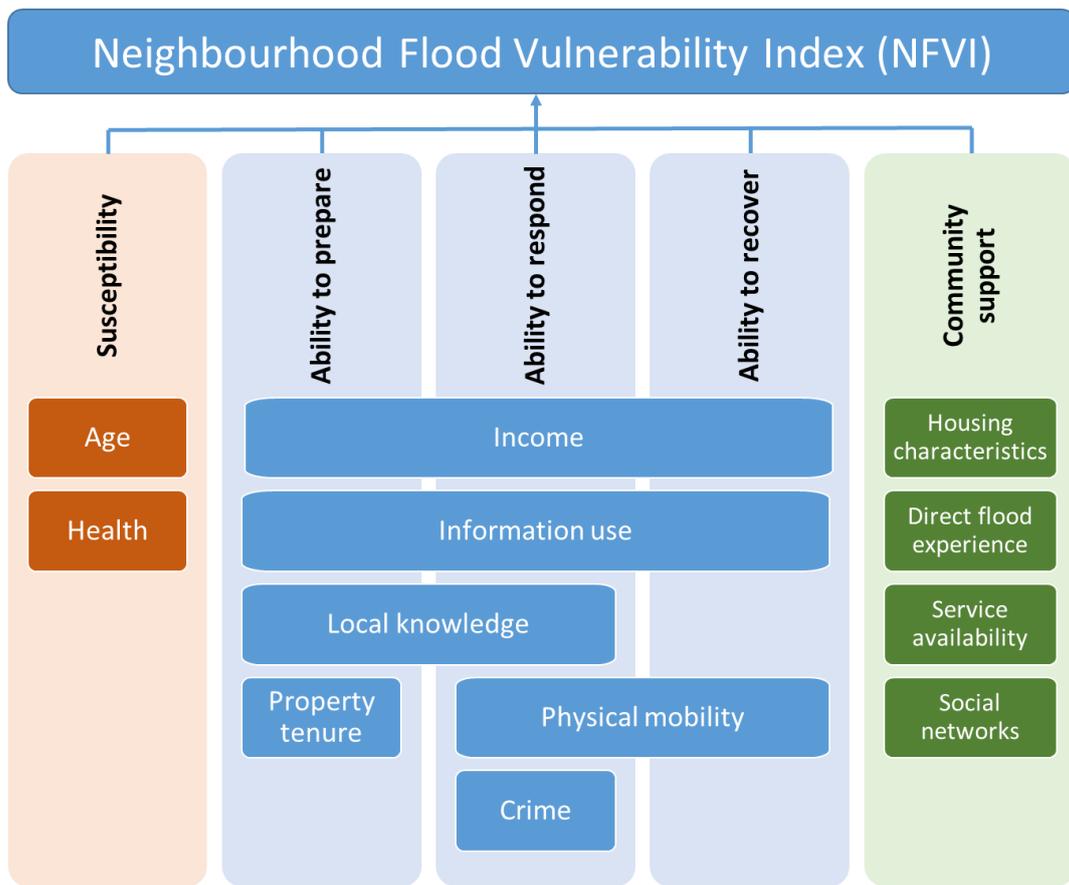
Flooding is the most dangerous and damaging natural hazard that the UK faces (Wheater, 2006). In England alone, 5.2 million properties are at risk from flooding, with expected annual damages estimated at more than £1 billion (EA, 2009). Furthermore, the UK climate change risk assessment (UKCCRA) has identified flooding as the greatest risk to the UK posed by climate change (DEFRA, 2015). Growing evidence for increases in heavy precipitation regionally, supports the view that the hydrological cycle is intensifying as the planet warms due to changes in atmospheric composition (Groisman et al., 2005; Huntington, 2006). In recent decades, winter rainfall and heavy precipitation events have proliferated. Therefore, flooding in the UK is likely to become a more severe and localised phenomenon in the future (Evans et al., 2004).

However, despite the increase in flood risk, recent natural disasters remind us of our society's increasing vulnerability to the consequences of population growth and urbanisation, economic and technical interdependence, and environmental change (Rougier et al., 2013). Across the UK there are clear spatial variances in community vulnerability and resiliency within flood risk areas (EA, 2006). Individual characteristics and external socio-economic, political and environmental factors are highly influential in creating this spatial difference (Burningham et al., 2007; Bubeck et al., 2012). Nevertheless, all these factors operate on different scales from local through to global (Cash and Moser, 2000) and can vary between whole communities, social groups, households, and individuals (Morrow, 1999).

Developing a better understanding of flood vulnerable communities and the risks they face is a prerequisite to delivering a socially just (i.e. fair) approach to prioritising flood risk management efforts within national policy and funding structures. It is true to say that evidence provided to policymakers has, to date, included very limited insight into flood disadvantage. In 2015, the Environment Agency's programme of flood and coastal erosion risk management sets out a six-year investment plan (2015-2021) for capital spending on flood risk management, which includes £2.5 billion of public investment (Environment Agency, 2010). England and Knox (2015: 3) suggested that 'while sufficient investment is important, every pound spent must also provide the best long-term value for money. This should mean considering both the social as well as the economic costs and impacts in investment plans'. However, there has been limited alignment between planned investment and areas where high levels of vulnerability and exposure combine (England and Knox, 2015).

Social vulnerability can be measured using hypothetical indicators which assess vulnerability in a quantitative manner. An index is made up of a set of factors; which can be defined as inherent characteristics that quantitatively estimate the condition of a system: they usually focus on minor but telling pieces of that system that can give users a sense of the bigger picture (Balica, 2012). They can be used on a comparative basis and allow the identification of priority areas for the reduction of vulnerability (Adger et al 2004). However, Balica (2012: 3) also states that although 'indicators play a...significant policy role...they [also] represent only synoptic sides of a system at the diverse spatial scales.'

Research from academics such as Sayers *et al* (2017) identified that flood risk management policy typically considers vulnerability through the lens of deprivation (as indicated by the Index of Multiple Deprivation). A focus on deprivation however does not necessarily reflect a community's vulnerability to a flood should it occur. To overcome this short-coming they introduced two new measures; the Social Flood Risk Index (SFRI) and the Neighbourhood Flood Vulnerability Index (NFVI). The SFRI is used to identify where vulnerability and exposure coincide to create flood disadvantage. This is for both surface water flooding and river and coastal flooding. The NFVI is used to express the characteristics of an individual and the community in which they live that influence the potential to experience a loss of well-being when exposed to a flood and over which flood management policy has limited or no control. The NFVI combines the five domains of vulnerability: susceptibility, ability to prepare, ability to respond, ability to recover and community support. These five domains are based on a subset of twelve 'vulnerability indicators' (Figure 1.1). The extensive data used to calculate each indicator are summarised in Table 1.1.



**Figure 1.1:**Neighbourhood Flood Vulnerability Index: Influential domains and indicators (Sayers et al.,2017:26).

**Table 1.1:**Neighbourhood Flood Vulnerability Index: Indicators and supporting variables (Sayers et al.,2017:27).

| <b>Indicator</b>                   | <b>Supporting variables</b> |   |
|------------------------------------|-----------------------------|---|
| <b>Age</b>                         | a1                          | Young Children (% people under 5)   |
|                                    | a2                          | Older People (% people over 75)   |
| <b>Health</b>                      | h1                          | Disability / people in ill-health (% people whose day- to-day activities are limited) |
|                                    | h2                          | Households with at least one person with long term limiting illness (%)               |
| <b>Income</b>                      | i1                          | Unemployed (% unemployed)   |
|                                    | i2                          | Long-term unemployed (% who are long-term unemployed or who have never worked)        |
|                                    | i3                          | Low income occupations (% in routine or semi-routine occupations)                     |
|                                    | i4                          | Households with dependent children and no adults in employment (%)                    |
|                                    | i5                          | People income deprived (%)  |
| <b>Information use</b>             | f1                          | Recent arrivals to UK (% people with <1-year residency coming from outside UK)        |
|                                    | f2                          | Level of proficiency in English   |
| <b>Local knowledge</b>             | k1                          | New migrants from outside the local area (%)  |
| <b>Tenure</b>                      | t1                          | Private renters (% Households)  |
|                                    | t2                          | Social renters (% households renting from social landlords)                           |
| <b>Physical mobility</b>           | m1                          | High levels of disability (% disabled)  |
|                                    | m2                          | People living in medical and care establishments (%)                                  |
|                                    | m3                          | Lack of private transport (% households with no car or van)                           |
| <b>Crime</b>                       | c1                          | High levels of crime  |
| <b>Housing characteristics</b>     | hc1                         | Caravan or other mobile or temporary structures in all households (%)                 |
| <b>Direct flood experience</b>     | e1                          | No. of properties exposed to significant flood risk (%)                               |
| <b>Service availability</b>        | s1                          | Emergency services exposed to flooding (%)  |
|                                    | s2                          | Care homes exposed to flooding (%)  |
|                                    | s3                          | GP surgeries exposed to flooding (%)  |
|                                    | s4                          | Schools exposed to flooding (%)   |
| <b>Social networks (non-flood)</b> | n1                          | Single-pensioner households (%)   |
|                                    | n2                          | Lone-parent households with dependent children (%)                                    |
|                                    | n3                          | Children of primary school age (4-11) in the population (%)                           |

## 1.2 Project Aim and Deliverables

### 1.2.1 Aim

This project aimed to test the outputs of the flood resilience for disadvantaged areas project to establish if they can be used at a local scale to help target flood risk management interventions to disadvantaged communities. The work involved engagement with two local authorities to identify socially vulnerable and flood exposed communities and conduct workshops with practitioners in these areas working across social and environmental concerns to support targeting of local responses.

The potential benefits are that the methodology could be used to help target interventions to the most flood disadvantaged groups in the future, working with Risk Management Authorities such as Environment Agency, Lead Local Flood Authorities and water companies. It might also be used to help target interventions on specific topics, such as insurance.

### 1.2.2 Deliverables

The outputs of the project consist of a report and a case study for the Climate Just website.

## 2. Approach

### 2.1 Regions and Test Area

As part of this project, the two locations were identified from the Sayers et al (2017) report as being particularly disadvantaged to flooding. Two initial locations were Greater Manchester and the County of Kent. The National Flood Forum met with the Lead Local Flood Authorities for both Rochdale MBC (in Greater Manchester) and Kent to identify which locations within each area were suited to this project and whether the results produced could help them in directing future interventions. Subsequently, the Isle of Sheppey situated in the county of Kent (section 2.1.1) and Rochdale in Greater Manchester (section 2.1.2) were highlighted and taken forward in this project.

#### 2.1.1 Isle of Sheppey, Kent

The Isle of Sheppey is situated in the South-East of England and is part of Swale Borough in the North-East area of Kent. The Medway, Swale and Thames estuaries present the principal source of flooding in the Borough. The Swale is a tidal water body separating the Isle of Sheppey from the rest of the district. It comprises a combination of water from the Thames Estuary, to the north of the Isle of Sheppey, and the Medway Estuary, to part of the western boundary of the borough and to the west of the Isle of Sheppey (Halcrow, 2009; Kent County Council, 2017). The most significant flood events within the Borough occurred in 1953 and 1978, and were primarily tidal flooding. On the night of 31

January 1953, a significant storm surge propagated down the North Sea caused flooding and overtopping of tidal defences at Sheerness and along the western border of the Isle of Sheppey. In January 1978, Sheerness was partially affected by flooding on the island.

Windmill Creek, the Scrapsgate Drain, the Capel Fleet Drain and the Warden Bay Stream are all designated main rivers in the Borough and are located on the Isle of Sheppey. There are no recorded incidents of solely fluvial flooding from any of these main rivers. While the rivers will contribute to a flood, any fluvial contribution from these watercourses is likely to be negligible owing to the large volume of water propagating up their channels during a tidal flooding event. 'Tide-locking' of their outfalls can also restrict the free-flow of water from the watercourses to the sea. Tide-locking has affected several of the watercourses across the district, most notably impacting the Scrapsgate Drain and watercourses at Warden Bay on the Isle of Sheppey. Tide-locking occurs when the outfall from a watercourse or sewer becomes overwhelmed by tidal waters in a receiving water-body. When the outfall becomes submerged, its ability to freely discharge the water from upstream can be severely reduced, causing water to back-up behind the structure. Further problems can be caused if tide flaps fail, causing tidal ingress into the fluvial watercourse.

However, despite the tidal and fluvial flood risk, there have been recordings of flooding from surface water, ground water and sewers. Incidents relating to sewer flooding show that although all the main towns - Sittingbourne, Sheerness, Warden, and Minster have incidents of flooding, the latter one appears to have a particularly high density compared to the others (Halcrow, 2012). Furthermore, due to the low-lying nature of the Isle of Sheppey groundwater flood risk is most prevalent resulting in the limited ability for the drainage system to convey surface water away from significant receptors (Halcrow, 2012). This combined with the possibility of tide-locking for coastally located hotspots exacerbates flood risk further.

When considering the Isle of Sheppey, it is clear that the most significant flood risk is posed by the sea as it has a large coastline. Sayers *et al.*, (2017: i) stated that 'Coastal areas...are...highlighted as representing the greatest concentrations of disadvantage (as measured by the SFRI).' When considering the most vulnerable neighbourhoods (top 5% of the NFVI), over 50% of the population exposed to flooding in vulnerable neighbourhoods are located in just ten local authorities, the Swale Borough being one of them (Sayers et al., 2017). Furthermore, the SFRI has highlighted that Swale is one of the ten most flood disadvantaged local authorities in the UK (Sayers et al., 2017).

Sayers et al (2017: 32) 'The most vulnerable communities are over-represented in areas prone to flooding from all sources, and significant over-represented in areas prone to coastal (and tidal)

flooding.’ This disproportion with continue to persist into the future under predicted population growth and predicted changes in climate (2°C temperature increase) (Sayers et al 2017).

### 2.1.2 Rochdale, Greater Manchester

Rochdale Metropolitan Borough Council (Rochdale MBC) is situated in the North of England and is part of Greater Manchester. The town of Rochdale sits at the foothills of the South Pennines and is the fifth largest settlement of the Greater Manchester Urban Area. There is a mixture of high-density urban areas, suburbs, semi-rural and rural locations in Rochdale, but overwhelmingly the land use in the town is urban. However, the River Roch catchment upstream of Rochdale and Littleborough includes large areas of upland farmland and moorland. There are many other smaller towns surrounding Rochdale centre such as Littleborough and Heywood.

The flood risk in Rochdale is often from several sources and many of the locations where flood risk is higher have a combined risk of, for example, fluvial and surface water flooding. In September 2013 it was estimated that 958 properties in Rochdale Borough are located in areas with a high probability of flooding from rivers i.e. shown on the Environment Agency’s flood map as having a 1% or greater chance of being affected by flooding each year (Rochdale Metropolitan Borough Council, 2014).

The main fluvial flood risk is posed by the River Roch and its tributaries. Many of the main residential and employment locations and town centres are located along the Roch valley or its tributaries. The areas where the River Roch flows in central Rochdale, around Wardleworth and Heybrook and in central Littleborough are also designated as a Flash Flooding Area i.e. where watercourses can rise quickly in response to intense rainfall with peak river flows possible within a few hours. This type of flood risk is caused by a variety of factors, including dense urban layouts and in Littleborough, steep sided water catchments flowing into the settlement in the river valley. Due to the potential for flood risk in these areas to develop over a short space of time with little warning, flood response can be challenging to organise and deploy.

Surface water has also been identified as a source of flood risk. In 2013, the Greater Manchester Surface Water Management Plan (GMSWMP) identified that surface water flood risk in Rochdale MBC is quite widespread but is also very localised in its impacts and often closely aligned with fluvial flood risk from rivers and other water bodies (JBA Consulting, 2012). Furthermore, the Bury, Rochdale and Oldham Strategic Flood Risk Assessment (2009) identified Critical Drainage Areas (CDA) in Rochdale MBC which focused on the urban areas of Heywood and Littleborough. CDA’s were identified as areas where surface water risk was established as most widespread and significant (JBA Consulting, 2009). During the summer of 2004 and 2006, over 200 properties flooded in Heywood with up to 900mm of sewage contaminated water for up to 3 hours. Around 90 properties had to be evacuated for varying

timespans whilst renovation was taking place (JBA Consulting, 2012). Other potential sources of flood risk are groundwater, canals, reservoirs, ponds and sewers.

The most recent flooding event occurred on Boxing day 2015; Storm Eva cause some of the most widespread flooding ever experienced in Greater Manchester. Prolonged, intense rain falling on already saturated catchments led to river levels rising rapidly. Many rivers reached record levels with over 80% of the flooding caused by main rivers. In Rochdale, residents were evacuated by boat, tractor and even a wheelie bin as the depths were so great. It was recorded that 324 properties were flooded internally within Rochdale MBC during the flooding event in 2015 (Figure 2.1) (Greater Manchester Lead Local Flood Authorities, 2016). The area also saw power loss, transport disruptions and loss of water supply.

**Table 2.1:** Locations within Rochdale Borough that were affected by internal flooding during Storm Eva in 2015 (Greater Manchester Lead Local Flood Authorities, 2016: 18).

| Location  | Main River | Ordinary Watercourse | Sewer | Surface Water | Total |
|---|------------|----------------------|-------|---------------|-------|
| Rochdale  | 288        | 1                    | 0     | 34            | 324   |
| Belfield  | 10         | 0                    | 0     | 0             | 10    |
| Heap Bridge, Heywood  | 10         | 0                    | 0     | 0             | 10    |
| Hooley Bridge, Heywood  | 20         | 0                    | 0     | 0             | 20    |
| Littleborough   | 158        | 0                    | 0     | 17            | 175   |
| Milnrow   | 1          | 0                    | 1     | 9             | 11    |
| Rochdale (disperse properties)                                  | 0          | 0                    | 0     | 8             | 8     |
| Rochdale Town Centre, including Mitchell Hey and Sparth Bottoms | 54         | 0                    | 0     | 0             | 54    |
| Wardleworth and Hey Brook                                       | 35         | 1                    | 0     | 0             | 36    |

It is clear that the most significant flood risk is posed by the River Roch and surface water from the built environment. Pike et al., (2016) undertook a study that identified prominent cities in decline through the development of an indicator of relative decline which captures the numerous factors involved in city decline over a longer time scale. They found that cities experiencing the highest levels of relative decline on the index were primarily in northern England; Rochdale being one of them. Based on these findings, Sayers et al (2017:54) found that these ‘cities in decline experience levels of flood disadvantage above the UK average; suggesting flood risk could undermine economic growth in areas that need it most and lead to a spiral of decline (if repeated floods occur).’ This reflects a combination

of influences but is driven by higher than average levels of vulnerability (as shown by the NFVI) and a greater average number of people exposed to frequent flooding (Sayers et al., 2017).

Furthermore, as many vulnerable people living in the floodplain are in urban settings such as Rochdale, it is important to note the future perturbations of vulnerability resulting from predicted population growth, predicted changes in climate (+4°C temperature increase) and the continuation of current adaptation approaches. Sayers et al (2017: 33-44) found that by the 2080s, 'urban neighbourhoods will experience a significant increase in risk' and that the greatest increases will be 'experienced in areas prone to surface water and fluvial flooding'; much like that of Rochdale.

## 2.2 Data and Mapping

This project had the aim of establishing whether the data use in the Sayers et al (2017) study can be used at a local scale to help target flood risk management interventions to disadvantaged communities. Therefore, the data required was varied in its origin and type. In addition to the Sayers data, this project used Environment Agency National Flood Risk Assessment Maps, Environment Agency Surface Water Flood Risk Maps, Ordnance Survey maps, internal property flood data from the Flood Investigation Report for Greater Manchester (2016) and the data from the Sayers et al (2017) report.

The data from the Environment Agency National Flood Risk Assessment Maps and the surface water flood risk maps were used to highlight the flood risk for both the Isle of Sheppey and Rochdale MBC. The internal property flood data from the Flood Investigation Report for Greater Manchester (2016) was used to identify clusters of actual properties that had flooded internally during the 2015 flooding event in Rochdale. Ordnance Survey maps were used as a base layer for the data sets produced by the Sayers et al (2017) report; this helped in the identification of locations and related infrastructure. Finally, the data used in the Sayers et al (2017) report was accessed from the University of Manchester; it originated from the Office of National Statistics and was analysed by the University of Manchester. The analysed data was then input into the QGIS mapping software and overlain onto the Ordnance Survey map. As all the data used was in mapped format this aided in the direct comparison of data and created visual material for the workshops.

## 2.3 Workshops

### 2.3.1 Preparatory Interaction and Communication

Both the workshops in Rochdale and the Isle of Sheppey were set up through a similar process:

- communicating with relevant partners,
- planning the content and logistics, and
- running the workshops.

A wide range of partners were contacted. Once they had agreed to participate in the workshop, specific content and the format of the workshop was planned to ensure that the correct information was captured. Invitations were sent, with details of venue information, agendas and briefing documents to all invites in advance of the workshop.

### 2.3.2 The Workshop and Methodologies Used

An informal environment was created for both workshops to make the most of a participatory methodology. Participants included representatives from The Environment Agency, local authority staff from a selection of flood risk management, planning, housing, social care, resilience, climate change adaptation, public health and Flood Re together with non-governmental organisations that operate nationally and locally such as Groundwork. It was designed to bring together the less usual suspects who don't always work together, such as social care and public health in local authorities and organisations working with vulnerable groups as well as flood risk managers and spatial planners; the aim being to generate discussions that bring understanding from both a social and an environmental perspective about how to improve community resilience in the context of flooding. The agenda and briefing note for both workshops can be seen in Appendices A and B respectively.

At the beginning of the workshop participants were welcomed, introduced to the agenda and the format to be followed explained.

The two workshops followed a slightly different format.

The Rochdale workshop took place on Thursday 26<sup>th</sup> October 2017. At the beginning participants were welcomed, introduced to the core topic of flood disadvantage and the format of the workshop. Following the introduction, the main elements and results of the Sayers et al (2017) report were presented, including their mapped and additional flood risk data. Participants were split into five groups, each with roughly 3 – 4 people. Each table had paper copies of the mapped Sayers et al (2017) data and flood risk data, blank Ordnance Survey Maps and question prompts for table discussion. The groups was tasked with discussing and annotating each map with their personal thoughts and

experience of the local area and to compare it to what the data was showing. A facilitated discussion took place at each table, ensuring that each participant could raise their views, the group remained focussed and ideas and information were captured.

Each group fed their key points back to the workshop and this was followed by further comparisons of the data with local knowledge and experience from all the participants in the room.

Following a refreshment break, the workshop followed the whole room discussion approach to consider the existing resilience work undertaken in the Borough and whether there any proposed projects that could take on a flood resilience aspect? In particular, the opportunity was taken to search for cross sectoral opportunities.

The results obtained were summarised to check understanding, and explanation was given of how the outputs of the workshop would be used, participants were asked to complete the feedback forms and thanked for participating.

The only difference in the format of the workshop in the Isle of Sheppey was that, due to the reduced number of participants, it proved more effective to drop the micro-group facilitation and run both sessions as a whole room discussion.

#### 2.4 Post Workshop: Survey, Written Report and Case Study

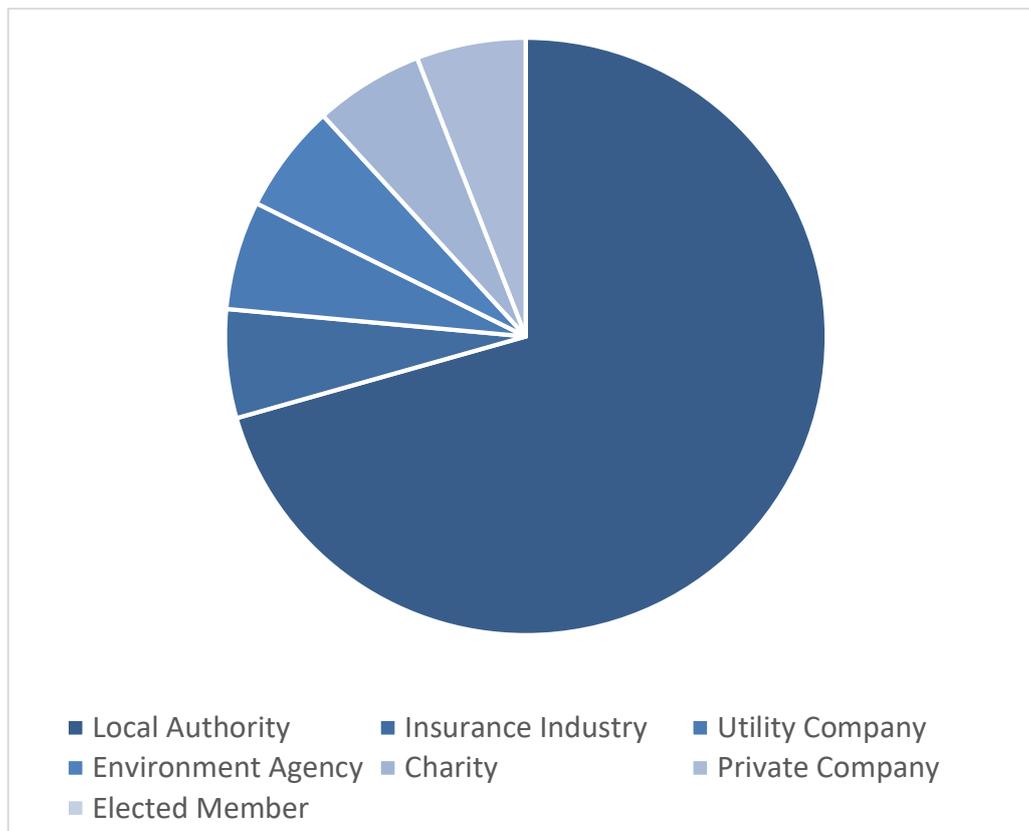
A post workshop feedback form (Appendix C) was distributed to participants which was designed to capture the value of the process for participants and to establish if it has changed their perceptions of priorities, including non-flood risk management sectors.

### 3. Results and Discussion

#### 3.1 Invitation and Attendance of Workshops

##### 3.1.1 Rochdale

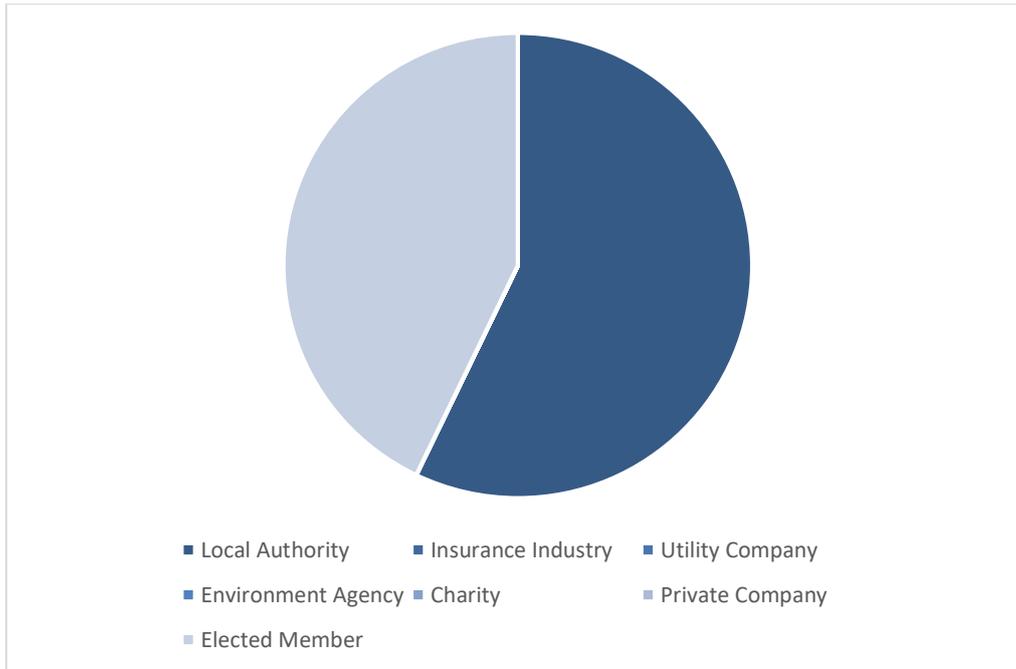
Of the 76 people contacted, 17 representatives attended the workshop. Figure 3.1 highlights the number of representatives from each sector; with the Local Authority having the highest representation.



**Figure 3.1:** Number of representatives from each sector that attended the Rochdale workshop.

##### 3.1.2 Isle of Sheppey

Of the 16-people contacted, 7 representatives attended the workshop. Figure 3.2 highlights the number of representatives that attended from each sector; with the Local Authority having the greatest number of representatives. It is key to note that the only sectors represented at the Isle of Sheppey were the Local Authority and Elected Members.



**Figure 3.2:** Number of representatives from each sector that attended the Isle of Sheppey workshop.

### 3.1.3 Discussion

It has been highlighted in the section 3.1.1 and 3.1.2 that although a large number of people had been contacted prior to the date of workshop, only a small percentage participated. Figure 3.1 shows that the majority (70.5%) of attendees came from a local authority background. This was also the case at the Isle of Sheppey workshop, where the only sectors represented were either from the local authority or elected members. Although, there was one representative from a charity at the Rochdale workshop, it was found to be increasingly difficult during the preparatory stage to persuade voluntary groups to participate in the workshop. This was due to them either being unable to attend on that specific date, that volunteers only worked on specific days of the week or that they would have rather spent their limited time making a difference to their customers and local community than attend a workshop.

## 3.2 Maps Presented and their Usefulness

### 3.2.1 Rochdale

The maps presented during the Rochdale workshop included:

- Neighbourhood Flood Vulnerability Index
- Surface Water Social Flood Risk Index
- River and Coastal Social Flood Risk Index
- Older People (% people over 75 years)

- People Income Deprived (%)
- Properties exposed to significant flood risk (% of homes in floodplain)
- Recent arrivals to the UK (% of people with <1 year of residency coming from outside the UK)
- Social renters (% households renting from social or council landlords)
- Unemployed (%)
- Flood Map for Rivers and Sea (Environment Agency, 2017a)
- Flood Map for Surface Water (Environment, Agency 2017b)
- Littleborough, Map of flood extents and reported property flooding (December 2015) (Flood Investigation Report for Greater Manchester, 2016)
- Town Centre, Map of flood extents and reported property flooding (December 2015) (Flood Investigation Report for Greater Manchester, 2016)
- Low insurance availability/affordability (% area potentially exposed to severe flooding) (Climate Just, 2014)

### 3.2.2 Isle of Sheppey

The maps presented during the Rochdale workshop included:

- Neighbourhood Flood Vulnerability Index
- Surface Water Social Flood Risk Index
- River and Coastal Social Flood Risk Index
- Caravan or other mobile or temporary structures in all households (%)
- % People living in medical and care establishments
- % households with at least one person with long term limiting illness
- New migrants from outside the local area
- Recent arrivals to the UK (% people with <1-year residency coming from outside the UK)
- Social renters (% households renting from social or council landlords)
- Unemployed (%)
- Low insurance availability/affordability (% area potentially exposed to severe flooding) (Climate Just, 2014)
- National Flood Risk Assessment (NaFRA) – Sheerness (Kent County Council, 2017)

### 3.2.3 Discussion

It was clear from the two workshops that the maps used to present the Sayers et al (2017) report data varied in how useful they were in helping to identify vulnerable neighbourhoods and communities. Discussion notes (Appendix D) and the completed post workshop feedback forms (Appendix E) have identified the main findings from the two workshops:

- In general, the maps closely correlated with reality on the ground, but there were gaps.
- The map legends were too descriptive and participants found it difficult to compare neighbourhoods based on the bandings used (i.e. Slight, Extremely Low, Relatively Low, Average, Relatively High, Extremely High, Acute).
- Many participants found that the map scale (Lower Super Output Areas) was not fine enough and lacked detail. Greater granularity was required to reflect real conditions on the ground
- Some of the mapped vulnerability indicators were not representative of the areas being examined. In both workshops, participants highlighted that the 'Unemployed' map did not reflect the working population. This appeared to be because the scales used on the legend bandings were set nationally, leading to little differentiation locally.
- Some particularly relevant data sets had not been included. Those highlighted include people suffering with mental health problems, owner occupiers, those that are unregistered for housing, transient populations and populations within prisons.
- Some of the data was out of date and no longer reflected the situation on the ground, particularly where it originated from the Office of National Statistics Census 2011.

Overall, despite these shortfalls the data in both workshops usefully described an overall picture of the areas that supported a wide-ranging discussion with all participants. It was clear from both workshops that the data (flood risk, flood disadvantage and vulnerability) enabled participants to identify quite specific areas of flood risk, its sources and areas of vulnerability. From the initial identification of issues, the discussion sessions of the workshop enabled practitioners from different professional backgrounds to share their local knowledge and experience of either flood risk or vulnerability. This section of the workshop in both Rochdale and the Isle of Sheppey proved important in determining whether the data was truly representative of the characteristics of the area as well as identifying any other drivers behind individual or community vulnerability.

## 3.3 Discussion Generated

### 3.3.1 Rochdale

During both workshops it was clear that the format and presentation materials used throughout proved successful in opening the discussion on vulnerability and flood disadvantage with various practitioners on a borough/district level.

Once areas had been identified as being vulnerable and participants had discussed the possible drivers behind that, the conversation turned to current and future projects to address the current vulnerability. During the Rochdale workshop, participants highlighted current projects that had been combined to tackle various aspects of vulnerability and increase resilience. The flood risk management team and housing teams had explained how they worked in partnership following Storm Eva in 2016. This work involved working with householders to obtain and utilise the DEFRA Repair and Renew Grant in implementing Property Level Resilience measures. Although this project required a lot of time and effort, it received one of the highest uptake levels of the DEFRA Repair and Renew Grants in the UK.

Furthermore, due to the variety of practitioners who attended the workshop future projects were suggested and partnerships built. The availability of insurance in Rochdale was highlighted as being a prominent problem in the Borough due to lack of awareness, ethnicity, language barriers, low educational attainment and poverty. Representatives from the flood risk management team, equalities team and Flood Re discussed the possibility of increasing awareness of the Flood Re Insurance Scheme through current projects and events, as well as any future projects. The equalities officer highlighted the need for personal translation of home insurance information as this is better received by foreign nationals. This could be undertaken through current workshops and events that are already taking place in the localised area.

### 3.3.2 Isle of Sheppey

During the workshop on the Isle of Sheppey, participants identified areas of vulnerability and suggested additional factors which could increase this for individuals and particular communities. For example, participants identified through the NFVI and the SFRI that residents in Sheerness are vulnerable as well as being increasingly exposed to flooding. Participants were able to highlight additional reasons why residents in Sheerness would become vulnerable and disadvantaged. One example highlighted that residents in Sheerness are known to have low levels of flood awareness. Having a low awareness of the flood risk has been increasingly documented as a driver of increasing one's vulnerability to flooding (Messner and Meyer, 2005). In addition, differing perceptions of risk by

the public has been closely correlated to low awareness. Participants at the workshop in Sheerness identified that there is a very high sea wall protecting the houses behind it. They reported that the construction of the sea wall has had an adverse effect on residents' perception of flood risk as they feel that it will always stop them from being flooded. This is a well-documented adverse effect on one's vulnerability to flooding (Terpstra, 2011). Grothmann and Reusswig (2006: 107) found that 'if the residents at risk rely on the efficacy of the public or administrative flood protection they will probably take less precautionary action themselves.'

### 3.3.3 Discussion

It was clear from both workshops that the data (flood risk, flood disadvantage and vulnerability) enabled participants to identify quite specific areas of flood risk, its sources and areas of vulnerability. From the initial identification, the discussion sessions of the workshop enabled practitioners from different professional backgrounds to share their local knowledge and experience of either flood risk and/or vulnerability. This section of the workshop in both Rochdale and the Isle of Sheppey proved important in determining whether the data was truly representative of the characteristics of the area as well as identifying any other drivers behind individual or community vulnerability.

These particular examples highlighted that both flood risk data and vulnerability data needs to be combined with local knowledge and localised data to ensure that a comprehensive and holistic picture is produced about an area. During the workshop in Rochdale participants suggested the use of Section 19 Flood Investigation Reports. However, this would require the data collection and writing of these reports to be standardised, something that is currently being developed. Reports would also need to be sufficiently detailed to be of value. Furthermore, although participants in both workshops were able to identify vulnerable areas and the potential underlying indicators generally, it was clear that for this methodology to work at the local and community scale other practitioners would need to be included such as local charities. Further methodologies for this approach have been detailed in section 4.

It was also noted that the data provided a useful focus to generate relevant discussion. It helped to challenge or confirm participants perceptions and it is likely that without the data conversations would have been much more limited.

Will anything change as a result of the work undertaken? In Rochdale there is a long standing, comprehensive and integrated approach to flood risk management that includes traditional capital schemes, catchment based approaches, including natural flood risk management, long standing work with communities and cross sectoral approaches to tackling poor housing and flood risk. Therefore,

it is unlikely that the project will result in significant change. However, the workshop identified several possible collaborative approaches that could be pursued, such as encouraging household insurance uptake in areas where English is not the first language. The benefit of the pilot is that it validated the Sayers et al (2017) report in identifying areas of disadvantage.

In the Isle of Sheppey, there are fewer opportunities to undertake traditional flood risk management work, partly because the cost:benefit ratios of doing so are unlikely to be high enough under current partnership funding rules, due to the small number of properties affected by each problem, but also because the nature of the interventions is potentially very varied and would involve significant negotiation and coordination between partners. Nevertheless, the problems faced by people are significant, made worse by different types of vulnerability and leading to disadvantage.

There are many hundreds of communities across the country in this position, as identified by Sayers et al (2017). Whilst there is a huge amount of good work undertaken by Risk Management Authorities and communities to reduce and manage risk in these areas, using other sources of funding; there are still many communities that are vulnerable and who will never be a priority for support.

However, other approaches exist. In places such as the Isle of Sheppey there is the potential to develop flood action groups as a way of helping communities to live with their flood risk. Many flood action groups develop small-scale interventions that lead to practical solutions for people and communities. This enables communities to take control of the flooding issues in their lives and work with partner organisations to find and develop practical solutions and methods of coping. Programmes such as the DEFRA Flood Resilience Community Pathfinder demonstrated the benefits of this approach (DEFRA, 2015).

## 3.4 Post Workshop Survey

### 3.4.1 Feedback forms

Of the 17 representatives who participated in the Rochdale workshop, 7 returned their feedback forms and of the 7 representatives who attended the Isle of Sheppey workshop 6 returned their feedback forms. The information has been tabulated at Appendix E.

### 3.4.2 Discussion

The post workshop feedback forms gave an insight into various aspects of both the usefulness of the data used, the maps presented, whether using this methodology can help drive decision making as well as housekeeping of both workshops. The main findings highlighted by participants are:

- The data used during the workshops generated a discussion around flood disadvantage but needs to be refined. The specific data issues have previously been highlighted in Section 3.2.3, but in general issues arose around the broad scale, the age of the data used and how this can have a profound effect on the true representation of communities today.
- It was highlighted by almost every participant that the data should not be used on its own to drive decision making. The data should be used to generate discussion with local stakeholders to create a holistic approach to flood risk management and resilience interventions.
- Participants highlighted that not every sector had attended the workshops. Therefore, it is key to involve stakeholders from every sector, especially those working within the community.
- The methodology used in this pilot (i.e. workshops) provided a space and environment for various stakeholders to come together around a particular issue and hold discussions from different professional perspectives. It allowed for the sharing and generation of knowledge.
- As a result of the workshops potential future projects were highlighted.

## 4. Lessons and Further Recommendations

**1:** The methodology outlined in this report brought practitioners together from different sectors to discuss flood disadvantage, using the data from Sayers et. al. 2017 to generate the discussions. It demonstrated that the approach of combining data with local knowledge and skills provides a much more informed discussion about flood disadvantage than using data alone.

The methodology tested in this project demonstrated that using data from a variety of sectors and using it to shape and inform a discussion can lead to more informed narratives and potentially better targeting of resources than by relying either on data or on sector specific knowledge alone. The methodology demonstrated a scoping approach that generated useful results.

A particular feature of the methodology was accessing the knowledge and skills of people from different sectors to help inform the discussions. This contrasts with much of current practice on flooding which is very sector specific.

**2:** Decisions regarding the targeting of flood risk management or resilience measures should not be solely based on the data from the Sayers et al (2017) report. Such decisions should take a holistic approach and involve local data and knowledge from a wide variety of stakeholders.

This project set out to test whether the data from the Sayers et al (2017) report could be used by local practitioners to make localised decisions regarding the identification of flood disadvantaged communities and the implementation of specific flood risk management and resilience interventions. The usefulness of vulnerability assessments for policy-making is, however, contested. Many concerns relate to the interface between researchers and stakeholders; the information vulnerability assessments can provide and the ability of stakeholders to make use of it (Naess et al., 2006). During both workshops in Rochdale and the Isle of Sheppey, the mapped data was a useful starting point in identifying disadvantaged areas to flooding. However, participants expressed the view that data should not be the sole driver in decision making at the local level. It needs to be combined with local data, local knowledge and discussion for true representation to be made. Equally, discussions without the use of the data would have been less valuable.

There are many recommendations as to how to improve the use of vulnerability assessments. These include: involving stakeholders as active participants not merely passive recipients of information;

involving users early in the process and combining users' own lay knowledge with expert knowledge (Naess et al., 2006). Naess et al., (2006: 222) proposed a "dialectic approach which is broad enough to include perspectives and data, ranging from the natural sciences to different social sciences, as well as the local information held by the users themselves. Three key components of this approach are outlined: (a) a framework for identifying vulnerable areas, utilising the strengths of different viewpoints; (b) a focus on vulnerability assessments as a long-term process rather than a one-off assessment product; and (c) an emphasis on grounding the assessment in local processes, but without overlooking the national level." The dialect approach implies a transfer of information and perspectives on vulnerability and flood disadvantage across scales and levels. In this project descriptive mapping of vulnerability has revealed how vulnerability varies across the country, as well as the extent of the challenges the country might be faced with. However, in the local context, the Sayers Report (2017) also ranked local authorities nationally which triggered local discussions. If a local authority is given a relatively high vulnerability-ranking, for example, it may lead to critical debates over the implications of such labelling, and its fit with local realities (Naess et al., 2006). This is further complicated by the very fragmented pattern of flood risk in the UK compared to countries such as the Netherlands (Flikweert and Jaap, 2014). In the UK flooding and vulnerability often occur at a finer scale than super-output areas, affecting perhaps a few houses in a street or a few streets in a wider area.

**3:** The scale of that data presented in the Sayers et al (2017) report was useful as part of a scoping exercise, helping to generate discussions about a range of flood disadvantage issues. However, it did not hold sufficient detail to base decisions on. It is recommended that additional finer scale data should be included to help inform discussions, including the ability to explore how sub-group characteristics, or the relationships between variables, differ between localities.

It is well-known that the results of analyses of aggregate data, such as those provided as outputs from censuses, are dependent on the size and shape of the zones used to report the data. However, many users of aggregate census data do not consider how far the zones utilised in their analyses capture spatial information about the population sub-groups they are studying (Lloyd, 2016). A lack of sufficient spatial detail creates problems for any application which is reliant on detailed spatial information (e.g. targeting area deprivation, analyses of socio-economic or ethnic segregation or spatial regression modelling). More generally, this means that we may lack sufficient information on the changing geographies of some population sub-groups and thus lack vital details about an important facet of social or economic change (Lloyd, 2016).

It was clear from the workshops in both Rochdale and the Isle of Sheppey that the maps used to present the data from the Sayers et al (2017) report varied with regards to how useful they were when identifying vulnerable neighbourhoods and communities. In general, participants noted that the maps closely correlated with reality on the ground but there were gaps. Many participants also found that the scale of the maps (Middle Super Output Areas) was not on a fine enough scale and lacked detail to enable them to make informed decisions. This then led participants to suggest that some of the maps were not representative of the areas being examined with regards to the vulnerability indicators. In both workshops, participants highlighted that the 'Unemployed' map was not representative of the working population. Lloyd (2016) undertook a study which sought to assess how far output areas (OAs) and aggregations of OAs capture information in selected population sub-groups and, therefore, how important it might be to use zones of a particular size in order to properly analyse the geographies of these subgroups. Lloyd (2016: 1187) found that "zones larger than OAs are not geographically detailed enough to enable meaningful analysis of local-level differences between places and thus any alternative to the Census in the United Kingdom (with England and Wales as a specific case) must provide zones equivalent in size to OAs. If estimates are available only for larger areas then much information will be lost and our ability to explore how sub-group characteristics, or the relationships between variables, differ between localities will be considerably diminished."

Therefore, it is recommended that if decisions are to be made based solely on data, then the development of indices and the data analysed should be at a finer scale, such as that outlined by Percival (2017). The study, undertaken by Percival in 2017, used flood hazard data, national census socio-economic data and Ordnance Survey topographic map data, to evaluate and map coastal flood vulnerability at micro scale. Similar to this project, Percival (2017) used the national census socio-economic data in identifying vulnerability indicators but analysed the data at an Output Area level – neighbourhood scale. Percival (2017: 29) stated that "by assessing at this scale, a detailed analysis of coastal flood vulnerability and risk could be carried out, producing indexes and corresponding maps identifying vulnerable and at-risk neighbourhoods." The methodology in this study allowed the identification of vulnerable and at-risk areas that had not been highlighted by previous flood risk assessments. However, it was noted by Percival (2017: 30) that "the limitation of a detailed assessment at the micro-scale used for this study is the time required to process the datasets."

**4:** Some of the data presented in the Sayers et al (2017) report was outdated due to its nature and origin. Particular datasets were found to be misleading and not a true representation of today, because changes had occurred since the data was collected, therefore representatives found it difficult to use the information as a basis for decisions. It is recommended that the data should be used in conjunction with other current sources of data and local knowledge held at the local level.

Participants during both workshops noted that some of the data used was out of date due to its nature and origin. The data originated from the Office of National Statistics and was last collated in 2011 in England and Wales. When studying socio-economic drivers to vulnerability, using data that is six years out of date can provide users with an altered perception of reality today. Likewise, when referencing the changing state of the UK's economy, Professor Sir Charles Bean in 2016 highlighted that ensuring statistics accurately reflect a changing economy is one of the hardest challenges National Statistic Institutes face. He stated that "as the economy evolves, so does the appropriate frame of reference for statistics: it is a constantly moving target. As a result, the internationally-agreed statistical methodologies will almost always be somewhat out of date or incomplete as they are bound to lag behind the changes in the economy" (Bean, 2016: 9). This can be related to the data that had been used in this project. The data was used to determine the driving socio-economic factors behind vulnerability and flood disadvantage. These factors are continually changing within society and therefore the data will always be outdated and cannot be taken as a true representation of society today.

Nevertheless, in both workshops, even the least accurate data generated a discussion about what the real situation was throughout the area and where more relevant and useful datasets might lie. The discussions also identified individuals who held specific local knowledge and/or data.

**5:** The methodology outlined in this report brought practitioners together from different sectors to discuss flood disadvantage. This was key in furthering the discussion and identifying socio-economic drivers for flood disadvantage at a local scale. However, it is recommended that this methodology is developed further, as outlined below, to increase participation of localised representatives from non-governmental organisations.

The workshop methodology used in this project was successful in both Rochdale and the Isle of Sheppey in bringing together representatives from different sectors that may not have previously thought of creating partnerships and sharing knowledge around flood disadvantage. This proved to be a key part of this project as it provided a space and context for representatives to discuss and critique together using individual knowledge bases. However, section 3.1.1 and 3.1.2 of this report has highlighted that although a large number of representatives had been contacted prior to the date of the workshops, only a small percentage actually attended the workshop on the day. Furthermore, Figure 3.1 highlights that the majority (70.5%) of attendees in the Rochdale workshop came from a local authority background. Although, we did have one representative from a charity at the Rochdale workshop; it was found to be increasingly difficult during the preparation stage for the event to contact charities and to persuade a representative to attend. This was due to them either being unable to attend on that specific date, that they only volunteer on specific days of the week or that they would have rather spent their limited time making a difference to their customers and local community.

It is recommended that these key representatives are contacted separately and are met in a local setting, such as in meetings to which they are already going, to enable them to share their knowledge and experiences of being on the ground. This is likely to involve a number of meetings in any given area, increasing the resources needed for the exercise.

An amended methodology would in effect create a three-stage process as outlined below:

1. Collect data and process it to be useful for presentation
2. Generate discussions across sectors through a workshop
3. Investigate issues further with key people and voluntary organisations in their environment to get their data and personal knowledge

**6:** The methodology outlined in this report brought practitioners together from different sectors to discuss flood disadvantage. However, it was clear during discussions that some issues were sector specific, for example, social renting, caravan sites and insurance. The workshop methodology used in this project could be used to identify and start to address such sector specific issues in relation to flood disadvantage.

The workshop methodology used in this project was successful in both Rochdale and the Isle of Sheppey in bringing together representatives from different sectors that may have not previously thought of creating partnerships and sharing knowledge around flood disadvantage. However, it was clear during discussions that some issues were sector specific. During the Isle of Sheppey workshop participants highlighted that there are very different issues around the island that involve very specific sectors. For example:

1. The meeting venue was affected by land management issues upstream and drainage issues on the nearby housing estate.
2. Insurance issues were identified in an area of large houses with apparently well-off residents, but this is potentially an asset rich and cash poor situation.
3. An area identified as having a high density of caravans. Whilst the caravans may be a flood disadvantage issue, they are strung along the coast and do not cover the whole area as indicated by the data. Some are also on relatively safe, higher ground.

Likewise, during the workshop in Rochdale participants highlighted that there are very different issues around the Borough that involve very specific sectors. For example:

- The influx of migrants from outside the UK to Rochdale and the specific uptake of home insurance was highlighted as an issue. The equalities team at Rochdale commented that, despite having leaflets in most of languages, most migrants may not understand the UK insurance industry from just reading a leaflet; they need translators to specifically explain insurance to them and allow them to have the opportunity to ask further questions.
- On the same topic of inaccessible home insurance, Rochdale Borough Housing were able to share details with Flood Re of their affordable insurance scheme for social tenants. This highlighted that different sectors were working independently on the same topic but with separate projects.

Overall, the workshops allowed participants to identify vulnerable communities and the potential reasons leading to disadvantage. Participants were able to share the issues that they face on

community vulnerability and current projects that they are involved in or aware of. They were then able to explore potential partnership approaches. Given that the workshops were short these ideas would need further development.

**7:** The Isle of Sheppey Pilot demonstrated that vulnerability and flood disadvantage existed in the area and that there were a lot of small scale projects needed that would potentially never get funding. The pilot approach could therefore be used to identify where need exists in areas such as this and to help target interventions, such as supporting the development of flood action groups.

The pilot identified flood disadvantage in both areas sampled. In the case of Rochdale, significant interventions such as the River Roch Scheme, are either underway or planned in order to manage that risk, although the pilot identified that there are opportunities to develop cross sectoral approaches that target disadvantage. On the Isle of Sheppey flood risk problems are of a much smaller scale and the lower populations are unlikely to generate cost:benefit ratio scores under current partnership funding rules to justify investments. In addition, many of the interventions required are likely to be complex, involve multiple partners across different sectors and both capital and maintenance issues. They may well also require coordinated approaches across individual catchments. Sayers et al (2017), identified that there are many communities like this across the country in both rural and urban areas who's flood risk is unlikely to improve and could get worse with climate change, new development and ageing infrastructure.

Supporting the development of Flood Action Groups that can work proactively with partner organisations from different sectors to reduce flood risk and help people to cope is now well established, such as evidenced in the DEFRA Flood Resilience Community Pathfinder (DEFRA, 2015). These groups can bring detailed local knowledge, skills and connections, as well as a vested interest in their wellbeing to complement the professional skills in organisations and can make a huge difference to better protecting their communities. In some cases, they are able to lead projects but in others the benefit is in working collectively over time to address detailed, often small scale, issues. However, they do need support to establish themselves and to start working effectively with partners effectively, ideally from an independent facilitator who is knowledgeable about flood risk.

The methodology identified in Recommendation 5 could therefore be used within specific areas to identify communities where there is the greatest disadvantage and where they are unlikely to benefit from large scale flood risk management schemes.

## 5. Case Study

A case study was produced in collaboration with the University of Manchester for the Climate Just website to extract any learning as part of the project and support future work focussing on disadvantage, vulnerability and social justice.

## 6. Conclusions

Flooding is the most dangerous and damaging natural hazard that the UK faces (Wheater, 2006). In England alone, 5.2 million properties are at risk from flooding (EA, 2009). Furthermore, the UK climate change risk assessment (UKCCRA) has identified flooding as the greatest risk to the UK posed by climate change (DEFRA, 2015). Recent natural disasters remind us of our society's increasing vulnerability to the consequences of population growth and urbanisation, economic and technical interdependence, and environmental change (Rougier et al., 2013). Developing a better understanding of flood vulnerable communities and the risks they face is a prerequisite to delivering a socially just (i.e. fair) approach to prioritising flood risk management efforts within national policy and funding structures.

Research from academics such as Sayers et al (2017) identified that flood risk management policy typically considers vulnerability through the lens of deprivation (as indicated by the Index of Multiple Deprivation). A focus on deprivation however does not necessarily reflect a community's vulnerability to a flood should it occur. To overcome this short-coming they introduced two new measures; the Social Flood Risk Index (SFRI) and the Neighbourhood Flood Vulnerability Index (NFVI). The SFRI is used to identify where vulnerability and exposure coincide to create flood disadvantage. This is for both surface water flooding and river and coastal flooding. The NFVI is used to express the characteristics of an individual and the community in which they live that influence the potential to experience a loss of well-being when exposed to a flood and over which flood management policy has limited or no control.

This project has used the data from the Sayers et al (2017) report and a workshop methodology to test whether this data is a true representation of the flood disadvantage of communities on the ground as well as testing whether the workshop methodology is a useful approach in identifying flood risk

management and resilience mitigation works in such communities. The workshop methodology proved successful in bringing together partners from different sectors to discuss community flood disadvantage in both Rochdale and the Isle of Sheppey. The workshops enabled participants to share sector specific issues, share current projects that are being undertaken in communities that are tackling aspects of vulnerability and enabling cross sector projects to be developed that produce multiple benefits to a community.

However, during both workshops participants identified shortfalls with the data in truly representing vulnerability factors at the community scale. The main finding from this pilot was that decision making regarding the targeting of flood risk management activities in disadvantaged communities, should not solely be driven by data. This report has demonstrated that the approach of combining data with local knowledge and skills provides a much more informed discussion about flood disadvantage than using data alone. Therefore, this report has outlined seven recommendations for furthering the methodology used in this pilot to ensure that holistic and inclusive decisions are being made regarding the targeting of flood risk management activities in disadvantaged communities. It is thought that this refined methodology could be utilised by all sectors across the UK to identify flood disadvantaged communities and future interventions.

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## 8. Appendices

### Appendix A: The agenda for the workshop in both Rochdale and the Isle of Sheppey.

#### Isle of Sheppey, Kent



**Testing approaches to flood resilience for disadvantaged areas  
A pilot to test the targeting of support to communities at risk from  
flooding**  
**10.00 – 13.00 – Monday 16<sup>th</sup> October 2017, The Abbey Hotel and  
Conference Centre, Minster, Sheerness, Kent, ME12 2DA.**

#### AGENDA

- 10:00 Registration
- 10:30 Welcome and Introductions
- 10:40 Objectives
- 10:55 What the *Testing approaches to flood resilience for disadvantage project* showed
- 11:00 Comparison of research project outputs with local data
- 11:15 Feedback session – which datasets make sense?
- 11:45 Refreshments
- 12:00 Interactive session – existing work and proposed projects
- 12:35 Summary and conclusions
- 12:50 Post workshop survey
- 13:00 Close and light lunch

1

**Supporting and representing flood risk communities**

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## Rochdale, Greater Manchester



**Testing approaches to flood resilience for disadvantaged areas  
A pilot to test the targeting of support to communities at risk from  
flooding**

**10.00am – 1:00pm, Thursday 26<sup>th</sup> October 2017,  
No.1 Riverside, Rochdale, OL16 1XU**

### AGENDA

- 10.00 Welcome and Introductions
- 10.10 Objectives
- 10.25 What the *Testing approaches to flood resilience for disadvantage project* showed
- 10.55 Comparison of research project outputs with local data
- 11.15 Feedback session – which datasets make sense?
- 11.45 Refreshments
- 12.00 Interactive session – existing work and proposed projects
- 12.35 Summary and conclusions
- 12.50 Post workshop survey
- 13.00 Close and light lunch

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### Supporting and representing flood risk communities

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## Appendix B: The briefing note for the workshop in both Rochdale and the Isle of Sheppey.

### Rochdale



#### BRIEFING NOTE

**Present and Future Flood vulnerability, risk and disadvantage: A workshop to test theories between communities at risk and their levels of flood resilience.**

#### Background

The report, Present and future flood vulnerability, risk and disadvantage: A UK assessment by Sayers and Partners for the Joseph Rowntree Foundation, highlights how floods interact with social vulnerability across the UK to create flood disadvantage, an issue which will be exacerbated by climate change. The report and its associated data can be found at <http://www.sayersandpartners.co.uk/flood-disadvantage.html>

Today some 6.4 million people live in flood prone areas, with around 1.5 million of these people living in vulnerable neighbourhoods (which include people on low incomes, with poor health and other factors that means floods are likely to have more negative impacts on people). According to the research, over 50% of the population exposed to flooding in the most vulnerable neighbourhoods can be found in just ten local authorities.

The number of people living in flood prone areas is set to increase to 10.8 million people by the 2080s, assuming a plausible but more extreme future scenario (of high population growth and a 4 degree centigrade increase in temperatures due to climate change). Cities in relative economic decline experience levels of flood disadvantage above the UK average, suggesting floods could undermine economic growth in areas that need it most and lead to a spiral of decline if repeated floods occur.

Recent developments are also facing increasing risk. Of the 300,000 properties built in the most socially vulnerable neighbourhoods between 2008-14, nearly 14% are in areas prone to fluvial or coastal flooding. By the 2080s, those living in these developments will experience a disproportional increase in flood risk compared to new developments built elsewhere in the floodplain. This is especially the case where new developments have taken place in socially vulnerable coastal communities.

The report highlights a series of recommendations for policymakers including:

- Adopt new indicators to highlight the risks faced by the most socially vulnerable (including a new Neighbourhood Flood Vulnerability Index (NFVI), a Social Flood Risk Index (SFRRI) and a measure of Relative Economic Pain (REP)
- Use these new indicators to better target support for the most socially vulnerable in flood investment decisions.
- Ensure flood risk management policy actively supports inclusive growth.
- Better reflect the disproportionate long-term flood risks faced by vulnerable neighbourhoods in national and local planning policy.

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#### Supporting and representing flood risk communities

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#### Purpose of the Pilot

This pilot aims to test the outputs of the 'Present and Future Flood vulnerability, risk and disadvantage' project to establish if they can be used at a local scale to help target flood risk management interventions to disadvantaged communities. In doing so, it will consider:

1. Does the output data from the Present and Future Flood vulnerability, risk and disadvantage' project make sense?
2. Is the methodology tested in the workshop a useful approach that can be replicated?

The knowledge and skills of people in specific localities, from a range of sectors, is required to test this effectively. In particular, the views of those working with disadvantaged communities are especially important in ensuring that the right communities are targeted.

#### Workshop approach

Pilot areas in Rochdale and Kent have been selected to test these questions, as these correspond with areas identified in the report as suffering particular flood disadvantage – cities in economic decline, coastal areas and places where capital schemes are unlikely to meet benefit:cost criteria for flood risk management schemes.

Half day workshops are being held in each area. Each workshop will use the outputs of the 'flood resilience for disadvantaged areas' project and consider these alongside local data on flood risk and social indicators, together with local knowledge from both a flood risk management and a social perspective to consider how it could support targeting of local responses.

#### Outputs

1. A post workshop survey to establish the value of the process for participants and if it has changed their perceptions of priorities, including for the non-flood risk management sectors.
2. A short, written report for the project will be produced detailing the work undertaken and the outputs in each of the two areas, including the workshops and the post workshop surveys. The report will evaluate the work in each area and in combination, seeking lessons that can be applied elsewhere. In particular, the report will highlight any wider patterns from the two project areas. Crucially, it will consider the benefits or otherwise of taking this approach to target flood risk management and draw out any conclusions for policy and operational delivery across sectors. Specifically, it will consider any implications for the Climate Just programme and its future development.
3. A short 2 page case study will be produced in collaboration with the University of Manchester for the Climate Just website to extract any learning as part of the project and support future work focussing on disadvantage, vulnerability and social justice.

## BRIEFING NOTE

**Present and Future Flood vulnerability, risk and disadvantage: A workshop to test theories between communities at risk and their levels of flood resilience.**

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Recent developments are also facing increasing risk. Of the 300,000 properties built in the most socially vulnerable neighbourhoods between 2008-14, nearly 14% are in areas prone to fluvial or coastal flooding. By the 2080s, those living in these developments will experience a disproportional increase in flood risk compared to new developments built elsewhere in the floodplain. This is especially the case where new developments have taken place in socially vulnerable coastal communities.

The report highlights a series of recommendations for policymakers including:

- Adopt new indicators to highlight the risks faced by the most socially vulnerable (including a new Neighbourhood Flood Vulnerability Index (NFVI), a Social Flood Risk Index (SFRI) and a measure of Relative Economic Pain (REP)
- Use these new indicators to better target support for the most socially vulnerable in flood investment decisions.
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3. A short 2-page case study will be produced in collaboration with the University of Manchester for the Climate Just website to extract any learning as part of the project and support future work focusing on disadvantage, vulnerability and social justice.

## Appendix C: Workshop Feedback Forms for both workshops in Rochdale and the Isle of Sheppey.

### Isle of Sheppey, Kent



#### A pilot to test the targeting of support to communities at risk from flooding

##### Post workshop survey

This pilot aims to test the outputs of the 'Present and Future Flood vulnerability, risk and disadvantage' project to establish if they can be used at a local scale to help target flood risk management interventions to disadvantaged communities. In doing so, it will consider:

1. Does the output data from the Present and Future Flood vulnerability, risk and disadvantage' project make sense?
2. Is the methodology tested in the workshop a useful approach that can be replicated?

The knowledge and skills of people in specific localities, from a range of sectors, is required to test this effectively. In particular, the views of those working with disadvantaged communities are especially important in ensuring that the right communities are targeted.

In addition, this survey is interested in the workshop approach, was it useful and could it be improved?

Finally, we are also interested in how you found the practical arrangements, the room and refreshments.

The outputs of the workshops and the surveys will be used to evaluate whether this approach could be developed and used more widely.

##### The Data

1. Does the Sayers data (flood risk and social) make sense on its own?
2. Does the Sayers data (both flood risk and socio-economic) provide a realistic representation of the locality when compared to local knowledge and data?
3. Does the combined data (Sayers and local) reflect the real state of affairs?
4. Did the discussion identify the issues of flood disadvantage in this locality, comparing the data with reality?
5. Please identify issues that were captured particularly well or which were left out.
6. Did the discussion highlight the range of projects and support to people at flood disadvantage?
7. Do these address the problems highlighted?

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**The workshop**

8. Was the workshop a useful approach to explore flood disadvantage that could work elsewhere?
9. Was the format of the workshop appropriate?
10. Was material presented in a way that was easy to understand?
11. Did the discussion sessions work?
12. What could it have been done differently?
13. A wide range of people were invited to participate. Was there anyone missing that could have made a significant contribution?

**Practical arrangements – please provide any comments about**

14. The venue
15. The room layout
16. Could you see and hear easily?
17. Did you feel able to contribute?
18. The refreshments

**Thank you**

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**A pilot to test the targeting of support to communities at risk from flooding**

**Post workshop survey**

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**The Data**

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**The workshop**

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12. What could it have been done differently?
13. A wide range of people were invited to participate. Was there anyone missing that could have made a significant contribution?

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14. The venue
15. The room layout
16. Could you see and hear easily?
17. Did you feel able to contribute?
18. The refreshments

**Thank you**

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**Appendix D: Discussion notes regarding the data used during the workshop in Rochdale and the Isle of Sheppey.**

| Rochdale, Greater Manchester              |   |
|---|---|
| Mapped Data                               | Notes from Discussion   |
| Neighbourhood Flood Vulnerability Index   | <ul style="list-style-type: none"> <li>• Similar to the deprivation index</li> <li>• Kind of what was expected but advised couldn't rely on solely.</li> <li>• Legend is only descriptive</li> <li>• The output area scale is not fine enough – vulnerability can change from house to house – it's too generalising. For example: in Littleborough there are pockets of vulnerability that have been missed in the mapping.</li> <li>• Data misses out mental health in the health band.</li> <li>• This is all based on out of date data.</li> </ul>  |
| Surface Water Social Flood Risk Index     | <ul style="list-style-type: none"> <li>• Some thought this looked representational</li> <li>• Relatively right – e.g. central Littleborough is a critical drainage area.</li> <li>• Rochdale is too broad – needs to be on a finer scale.</li> <li>• Tweak the data rather than rewrite.</li> <li>• The key is not helpful.</li> </ul>  |
| River and Coastal Social Flood Risk Index | <ul style="list-style-type: none"> <li>• Looks to be very misleading – Littleborough not really represented realistically – looks to be at lower risk when we know this neighbourhood has been heavily affected.</li> <li>• It was mentioned by a participant that the River and Coastal Social Flood Risk Index looked similar to the surface water map and they thought it would look different and follow more of a pattern along the River Roch corridor.</li> <li>• It was suggested that Milnrow was also questionable as it can also suffer with flooding – so the mixing of the vulnerability with the flood risk data can almost be misleading.</li> </ul> |
| Older People (% people over 75 years)     | <ul style="list-style-type: none"> <li>• Thought to be fairly representational but the scale “not helpful” and people asked for this and other maps were the data had come from and how the scaling was decided on.</li> <li>• Descriptive legend which is not helpful.</li> </ul>  |
| People Income Deprived                    | <ul style="list-style-type: none"> <li>• Most people didn't agree with this – thought that more known affluent areas were shown as income deprived but then thought this might have something to with the term income – as in maybe those with no income/unemployed (thought to be located as a majority in the more central areas) are not included in these statistics and therefore make the data misleading.</li> <li>• Are benefit payments included in the term income? Again, this could make data misleading.</li> </ul>  |

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• It was also noted does this link to older people – as in not having an income and could again be misleading?</li> <li>• Scale (%) was also noted again.</li> </ul>  |
| Properties exposed to significant flood risk (% of homes in floodplain)               | <ul style="list-style-type: none"> <li>• Definition of flood plain required – misleading term as most houses not “deemed” to be in flood plain that are at flood risk and the term “significant”.</li> <li>• Suggested maybe flood plains should be actually marked on so to compare.</li> <li>• Suggested data possibly too old – Boxing Day 2015 happened since.</li> <li>• Questioned why no variation in geography of area – could be scaling issues.</li> <li>• Questioned again where is the data is sourced from / compared to?</li> <li>• Hard to understand.</li> <li>• Deceiving as an indicator.</li> </ul>         |
| Recent arrivals to the UK (% of people with <1-year residency coming from outside UK) | <ul style="list-style-type: none"> <li>• Most thought it was realistic except for a pocket in the Bamford area, deemed as a more affluent area – again maybe casting some doubt on the data.</li> <li>• Value of scale again questioned.</li> <li>• Out of date data – data is 7 years old and this indicator can be fluid</li> <li>• Map would be very different today.</li> </ul>  |
| Social Renters (% households renting from Social or Council landlords)                | <ul style="list-style-type: none"> <li>• Deemed as misleading – too general / possibly inaccurate.</li> <li>• Private/unregistered renters not considered, or owner occupiers.</li> <li>• Legend scales and if any comparative data again questioned.</li> <li>• Descriptive legend.</li> <li>• Doesn’t cover transient renters – sometimes the turnover of residents renting is high. With a transient community, this can cause problems with lack of local knowledge or flood experience.</li> </ul>  |
| Unemployed  | <ul style="list-style-type: none"> <li>• All thought very misleading - even comments on “Doesn’t make sense”.</li> <li>• Legend scales and if any comparative data again questioned.</li> <li>• Noted unemployed but claiming benefits for various reasons due to ill health etc or stay at home mums out of choice not the same as unemployed.</li> <li>• Rochdale thought to have high unemployment compared to maybe National Average, but this data makes nearly the whole of Rochdale look acute and not thought to be the case.</li> <li>• Comments like contradicts the income deprived map data also noted.</li> </ul> |

|                              |             |
|------------------------------|-------------|
| Flood Map for Rivers and Sea | No comments |
| Flood Map for Surface Water  | No comments |

| Isle of Sheppey, Kent                     |   |
|---|---|
| Mapped Data                               | Notes from Discussion   |
| Neighbourhood Flood Vulnerability Index   | <p>This map correlates with the Index of Multiple of Deprivation. The Isle of Sheppey highest vulnerability in Kent apart from Thanet.</p> <p>There is one road in and out of the island and if the Eastern side is cut off, this could place people in danger, even if they have not flooded themselves. Access to food, bowser water, emergency services could be compromised. A substation also lies in the middle and if affected could result in loss of power to the East of the Island.</p> <p>In Sheerness two areas are identified as being at high risk, with a narrow strip of lower risk in between. It was not clear why one larger area was not identified. Both areas have extremely high deprivation and are exposed to flood risk.</p>   |
| Surface Water Social Flood Risk Index     | <p>Surface water flooding is always increasing on the island. The areas identified flood.</p> <p>Participants highlighted areas on the map with possible sources of flood risk: Scrapsgate drain and springs from minster hill.</p> <p>The island is a marsh, much of which was reclaimed from the sea. New building is disrupting water flows. Vulnerability is increasing.</p> <p>Scrapsgate drain (including the vicinity of the hotel) – Brambledown lies on Bagshot Beds (gravel and sands). Water percolates through the rock, under the housing estate to “here” and then backs up causing flooding.</p> <p>There are a huge number of springs in the eastern part of the island.</p> <p>In Sheerness, artesian wells are used to feed the docks. These are no longer used, and the water levels are rising. There are issues of water getting in to house basements and possibly internal flooding. When people in these areas flooded in the past it took a long time to recover, due to the high-water table.</p> <p>There is no surface water flooding in the Eastern bloc due to high ground with permeable surfaces.</p> |
| River and Coastal Social Flood Risk Index | No comment  |

|   |   |
|---|---|
| Caravan or other mobile or temporary structures in all households                     | Largely wrong due to the shape and size of the super output area. Caravans occur just along the northern coast. Highlights areas where no caravans exist. But, increasingly people are using the 10-month rule to live in the caravans all year. There is no enforcement. There is one area along the northern coast where there are clay cliffs. There are no caravans here.   |
| People living in medical and care establishments                                      | Largely wrong in the eastern area due to the size and shape of the super output area. Does this indicator just plot care homes, or include sheltered housing, facilities for the elderly, infirm and disabled?<br><br>Doesn't take account of the prison and perhaps limited access to food and power during a flood.   |
| Households with at least one person with a Long term limiting illness                 | Sheerness – high levels are correct.  |
| New migrants from outside the local area  | Largely wrong in the eastern area due to the size and shape of the super output area. Overall the map is misleading.  |
| Recent arrivals to the UK (% of people with <1-year residency coming from outside UK) | Sheerness is the focus. The map makes sense the concentration in Sheerness is correct.  |
| Social renters (% households renting from Social or Council landlords)                | There are also a lot of private renters, so it is not clear from this what the balance is. Also, people in private rented accommodation are more likely to be more vulnerable than those in social housing, who have a bigger organisation behind them. Most of the social housing is provided by Housing Associations.<br><br>A large part of the area identified in the East is marshland, with no one living there. The Super Output Area is misleading, so therefore the data is misleading. Yellow on map is Minster.<br><br>Misleading as would be concentrated in urban areas. The map shows social renting to be high across much of the island. This is the same as for private renting. Private renting is much more likely to be an issue linked to vulnerability as people may well be less supported. There should be a category for C1 and C2 house owners, who are often the most vulnerable and don't take out insurance.<br><br>Social renting is concentrated in Sheerness, Rushington (SW of Queensborough). New housing estates are in relatively well-off areas. |
| Unemployed  | The map showed consistently high levels of unemployment across the island. The equivalent employment indicators and all the subsets showed similar results. Participants did not recognise the unemployment map. They felt that unemployment was concentrated   |

|  |  |
|--|--|
|  | in some of the populated areas. Very misleading. The data doesn't tell us anything.  |
| Low insurance availability/affordability | <p>This map came from Climate Just using Middle Super Output areas. As an area of search this was felt to be ok, but it didn't really highlight some of the different types of flooding, just potential issues about getting insurance generally. The area of search was quite large. There was a discussion about how whether wealthier areas might also have problems accessing insurance – on the map one of these was highlighted as above average risk.</p> <p>Whitstable is a well-off area but highlighted as being at relative risk. This could be a factor of Council Tax rates and perhaps income, i.e. people may struggle to afford insurance.</p> <p>Strategically, it may be worth focussing on those areas which would suffer catastrophically if the sea wall were to be overtopped or fail, rather than places where the damage might be less. Reinstatement costs and the length of time to get people back in their homes might be much greater. A sea wall breach/overtopping combined with high water tables would provide nowhere for the water to go.</p> |
| National flood risk assessment           | Little comment.  |
| Flood map for surface water              | Makes sense.   |

**Appendix E: Tabulated information from completed post workshop surveys; both Rochdale and the Isle of Sheppey.**

| <b>Rochdale</b>   |                           |  |          |                                      |                    |          |          |          |          |
|---|---------------------------|--|----------|--------------------------------------|--------------------|----------|----------|----------|----------|
| <b>Question from Post-Workshop Feedback Form</b>  | <b>Participant Number</b> |  |          |                                      |                    |          |          |          |          |
|   | <b>1</b>                  | <b>2</b>   | <b>3</b> | <b>4</b>                             | <b>5</b>           | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> |
| <b>Does the output data from the Present and Future Flood vulnerability, risk and disadvantage' project make sense?</b> | No - too broad, vague     | Whilst the data makes sense, the scales used and key can be misleading |          | Further detail needed.               | Mostly but not all |          |          |          |          |
| <b>Is the methodology tested in the workshop a useful approach that can be replicated?</b>                              | If redefined and focused  | It could but needs more accuracy.                                      |          | A good basis which needs more adding |                    |          |          |          |          |

| The Data   |  |   |   |          |        |  |  |  |  |
|--|--|---|---|----------|--------|--|--|--|--|
| <b>Does the Sayers data (flood risk and social) make sense on its own?</b>   | Any analysis must be built around actual flood data - meaningless otherwise. | Not always given the keys/legend used.                            | Some of it did. The lack of clear scales didn't help. | No.      | No     | It was difficult to understand                                   | Some of it - esp those most at risk of preventing & recovery but weightings between data (old data) & flood likelihood needs looking at. | Once explained, Yes  | Some data appeared incorrect / very open to misinterpretation – in particular the scale descriptions and the level of detail seemed inappropriate and some of the data is now very out of date |
| <b>Does the Sayers data (both flood risk and social) provide a realistic representation of the locality when compared to local knowledge and data?</b> | No   | It isn't precise enough, streets as opposed to wards is required. | Broadly   | Not all. | Mostly | I think the detail has been difficult to identify with the data. | Some of it.  | No became too strategic and didn't pick up on smaller clusters of vulnerability and risk. This needed to be on a more street by street | No – there was a number of maps that appeared to be inconsistent with local knowledge  |

|   |                        |  |     |                 |           |  |  |  |   |
|---|------------------------|--|-----|-----------------|-----------|--|--|--|---|
|   |                        |  |     |                 |           |  |  | level to really understand what the issues and locations for these are.  |   |
| <b>Does the combined data (Sayers and local) reflect the real state of affairs?</b> | Not in correct format. | Generally yes but it needs to be more specific to be useful. | Yes | better picture. | No (some) | From listening to participants there is a lot of different information from the group. | On a few of the maps, but many are representative. | Again not really, there is the issue of the data not being current. I struggled initially to really understand what this was all trying to achieve, the way the data was displayed and the legends didn't make much sense. | Yes - to an extent. Some further details of local information were identified as being needed |

|   |                  |   |                               |                             |   |   |  |  |   |
|---|------------------|---|-------------------------------|-----------------------------|---|---|--|--|---|
| <p><b>Did the discussion identify the issues of flood disadvantage in this locality, comparing the data with reality?</b></p> | <p>Yes</p>       | <p>Yes, it identified how reality does not reflect plans.</p> | <p>Yes</p>                    | <p>Yes</p>                  | <p>Yes</p>  | <p>I think that it brought out the areas of concern.</p>  | <p>On a few occasions.</p>   | <p>There was/is already a good local knowledge of the issues in Rochdale and the maps did not seem to really portray them.</p>   | <p>Yes, but it appeared local knowledge was crucial to help validate the data as much was too large scale and / or the areas affected by flooding very localised</p>              |
| <p><b>Please identify issues that were captured particularly well, or which were left out.</b></p>                            | <p>Insurance</p> | <p>Data is not up to date and too general.</p>                | <p>Ideas of vulnerability</p> | <p>Vulnerability info -</p> | <p>Knowledge of local area from participants.</p> | <p>The difficulty in communities and not having insurance and the difference with local problems of flooding in individual areas.</p> | <p>The concept of disadvantage &amp; flood is really good. Need local data, upto date data &amp; local knowledge to a much greater degree.</p> | <p>I felt that if the maps/data needed to be quality assured to the degree that was evident then I struggled to see the value of doing this work in this way with data that has the potential to</p> | <p>Geographical information of likely flood areas was captured well ..... except that it had not taken into consideration more recent flooding particularly in Littleborough.</p> |

|  |              |   |             |                       |      |   |                  |   |   |
|--|--------------|---|-------------|-----------------------|------|---|------------------|---|---|
|  |              |   |             |                       |      |   |                  | influence outputs that could be misleading.   |   |
| <b>Did the discussion highlight the range of projects and support to people at flood disadvantage?</b> | Not in depth | It became very informative.                     | Not so much | Yes.                  | Yes  | I think that it brought out a lot of new information.   | Identified some. | The support available to people in the district is already known and not sure the workshop was needed to do this? | Hearing about ways of getting insurance, flood defences, etc was very useful. More time was needed  |
| <b>Do these address the problems highlighted?</b>  | No           | For the most part but some people are left out. | N/A         | As far as I am aware. | Some | Some of the information did and I think there is new areas that could be looked at in <i>(the)</i> community. |                  | The existing work and programmes available to the community is beneficial but are work in progress.               | Partially – again more time was needed to discuss different projects / identify approaches for getting this information to those affected |

| The workshop   |                      |                |     |     |     |                              |   |  |  |
|--|----------------------|----------------|-----|-----|-----|------------------------------|---|--|--|
| <b>Was the workshop a useful approach to explore flood disadvantage that could work elsewhere?</b> | If researched better | Yes I think so | Yes | Yes | Yes | Yes                          | Highlighted adv. But some issues were highlighted as needing attention. | I was a little confused about what we were trying to achieve as the focus was on the maps and any consideration to wider flood disadvantage issues may have got a little bit lost? | Yes – having an opportunity to discuss issues with such a wide range of participants was particularly useful |
| <b>Was the format of the workshop appropriate?</b>   | Yes                  | Yes it was     | Yes | Yes | Yes | Yes a lot of new information | Yes, interesting range of people to give different perspectives.        | Yes  | Yes  |

|   |     |   |   |     |     |  |                |   |  |
|---|-----|---|---|-----|-----|--|----------------|---|--|
| <b>Was material presented in a way that was easy to understand?</b> | Yes | Some of the plans could do with a different scale | Yes - see comments above about map scales | Yes | Yes | Yes  | Yes generally. | Somewhat but as I mentioned earlier it took a while to really understand what we were trying to do. | Unfortunately, there was some errors in copying the maps which caused confusion  |
| <b>Did the discussion sessions work?</b>                            | Yes | Yep   | Yes                                       | Yes | Yes | Yes really good as generated a lot of discussion | Yes            | In the fact that we acknowledged the data at this level was not useful.                             | Looking at all the maps in small groups was useful though feeding back did take up a quite a bit of time which limited the discussion on range of projects |

|  |  |                     |   |  |  |                          |  |   |   |
|--|--|---------------------|---|--|--|--------------------------|--|---|---|
| <b>What could it have been done differently?</b>   | Made source data available prior to meeting. | No suggestions      | \ |  |  | N/A                      | Worked with material you had & workshop style/questions were useful. | A little more clarity around the expected outcomes of the workshop. | Maybe ask each sub group to feedback on a particular set of data rather than everyone trying to look at them all would still have been effective but given more time for discussing the range of projects and support |
| <b>A wide range of people were invited to participate. Was there anyone missing that could have made a significant contribution?</b> | No   | Not that I'm aware. | \ | Good selection of people at the meeting. May have been useful to have Public Health Data | Private Landlords association rep for insurance purposes | Not that I can think of. | Not sure   | The group was good in the wide remit of the people there.           |   |

|   |                |                  |   |                |       |      |      |  |  |
|---|----------------|------------------|---|----------------|-------|------|------|--|--|
|   |                |                  |   | /Statistician. |       |      |      |  |  |
| <b>Practical arrangements</b>           |                |                  |   |                |       |      |      |  |  |
| <b>The venue</b>                        | VG - Very Good | Ideal            | v | Perfect        | great | Good | Good | Fine   |  |
| <b>The room layout</b>                  | VG - Very Good | V.Good           | v | Fine           | good  | Good | Good | Seemed a lot tables if there had been more people could have felt a bit cramped. |  |
| <b>Could you see and hear easily?</b>   | Yes            | Yes              | v | Yes            | yes   | Yes  | Yes  | Yes  |  |
| <b>Did you feel able to contribute?</b> | Yes            | When appropriate | v | Yes            | yes   | Yes  | Yes  | Yes  |  |

|                         |                |                     |              |       |                   |      |                              |      |           |
|-------------------------|----------------|---------------------|--------------|-------|-------------------|------|------------------------------|------|-----------|
| <b>The refreshments</b> | VG - Very Good | Went back for 2nd's | √ Thank you! | great | brill & thank you | Good | Good & a refreshing change!! | Good | Thank You |
|-------------------------|----------------|---------------------|--------------|-------|-------------------|------|------------------------------|------|-----------|

| <b>Isle of Sheppey, Kent</b>  |                               |   |          |   |          |          |
|---|-------------------------------|---|----------|---|----------|----------|
| <b>Question from Post-Workshop Feedback Form</b>  | <b>Participant Number</b>     |   |          |   |          |          |
|   | <b>1</b>                      | <b>2</b>                                  | <b>3</b> | <b>4</b>  | <b>5</b> | <b>6</b> |
| <b>Does the output data from the Present and Future Flood vulnerability, risk and disadvantage' project make sense?</b> | Yes                           | Yes, but needs refining (local knowledge) |          |   | Yes      |          |
| <b>Is the methodology tested in the workshop a useful approach that can be replicated?</b>                              |                               | Yes, but needs refining (local knowledge) |          |   | Yes      |          |
| <b>The Data</b>   |                               |   |          |   |          |          |
| <b>Does the Sayers data (flood risk and social) make sense on its own?</b>  | The data was unrepresentative | Could be clarified                        | Largely  | Yes, with the explanation given in the presentation | Yes      | No       |

|  |  |   |  |  |     |  |
|--|--|---|--|--|-----|--|
| <b>Does the Sayers data make sense (flood risk and social) when compared to local data and with local knowledge?</b>   | In general, yes, but local knowledge can narrow down and highlight most vulnerable areas | Not sufficiently clear (complex picture)  | Generally, yes                                     | Yes, generally, although using super output areas did distort local specifics                        | No  | No   |
| <b>Does the combined data (Sayers and local) reflect the real state of affairs?</b>                                    | In general, the real state of affairs was replicated                                     | Partially   | To some extent. Output areas too big in some cases | Generally, as discussed in the group   | No  | No - 2011 lots of changes  |
| <b>Did the discussion identify the issues of flood disadvantage in this locality, comparing the data with reality?</b> | The discussion did identify issues of flood disadvantage                                 | Yes, very useful  | Yes  | Yes  | Yes | Yes  |
| <b>Please identify issues that were captured particularly well or which were left out</b>                              |  | Good graphics, but geography slightly misleading in terms of population density | Caravan sites, infrastructure                      | Generally, very good. Is accessibility (geographical) included - remoteness leading to disadvantage? |     | Left out local community housing, i.e. caravan parks and prisons |
| <b>Did the discussion highlight the range of projects and support to people at flood disadvantage?</b>                 | Yes  | Yes   | Yes  | Due to the makeup of the group some of the information wasn't available                              | Yes | Yes but more information in depth                                |
| <b>Do these address the problems highlighted?</b>  |  | Yes   | Not entirely                                       | Not sure   | Yes | Yes  |

| <b>The workshop</b>  |   |  |                                   |  |  |   |
|--|---|--|-----------------------------------|--|--|---|
| <b>Was the workshop a useful approach to explore flood disadvantage that could work elsewhere?</b> | Yes, the discussion was able to highlight flood disadvantages | Yes  | Yes                               | Yes  | Yes  | Yes   |
| <b>Was the format of the workshop appropriate?</b>   | Yes   | Yes, very good                               |                                   | Yes  |  | Yes   |
| <b>Was material presented in a way that was easy to understand?</b>                                | Some of the data was difficult to interpret                   | Yes, notwithstanding complexity of the topic | Yes                               | Yes  | Maps unclear                                       | Could be simpler for community participants |
| <b>Did the discussion sessions work?</b>   | Yes   | Yes  | Yes                               | Yes  | Yes  | Yes   |
| <b>What could it have been done differently?</b>   | No  | It was fine                                  | More information before the event | Invitation could have been repeated with greater explanation of what was expected so preparation could be done | More local information required before the meeting | N/A   |

|  |  |   |  |   |                     |   |
|--|--|---|--|---|---------------------|---|
| <b>Was there anyone missing that could have made a significant contribution?</b> |  | Yes, other statutory agencies and more local people (late venue notification) | KCC staff & councillors, more PCs, SBC councillors, EA, etc. | KCC, Emergency Planning (Swale BC), NHS/social services, housing providers, local councillors, IDB, local NGOs, charities | Don't know          | Local councillors, borough and parish     |
| <b>Practical arrangements</b>  |  |   |  |   |                     |   |
| <b>The venue</b>   |  | Good  | OK   | Good  | Good, close to home | Yes - late notice of date, time and venue |
| <b>The room layout</b>   |  | No problem  | OK   | Good  | Fine                | Yes                                       |
| <b>Could you see and hear easily?</b>  |  | Yes   | yes  | Yes   | Yes, very well      | Very                                      |
| <b>Did you feel able to contribute?</b>  |  | Yes   | yes  | Yes   | Yes                 | Yes 100%                                  |
| <b>The refreshments</b>  |  | Good  |  | All fine  |                     | Yes                                       |