

## Targeting flood investment and policy to minimise flood disadvantage

There is a growing risk of flooding in England, and some parts of the country face greater disadvantage from flooding than others. This briefing explains what causes this disadvantage, and shows how flood investment could be targeted more effectively to support those communities.

If you would like to arrange a meeting with one of our experts to discuss the points raised please contact:

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### Key points

- There is no particular alignment between planned expenditure for 2015-21 and the extent of flood disadvantage in a local authority.
- The 249 most flood disadvantaged neighbourhoods are in 104 of the 326 local authority districts and unitaries in England – and only 100 of the 1,493 schemes in the investment pipeline are in these neighbourhoods.
- The average investment per local authority per household protected was £6,610, but areas with fewer flood disadvantaged neighbourhoods were in some cases due to receive substantially higher spending than those with a greater number.
- Almost half (47.8 per cent) or £2bn of total planned investment is for local authorities with no neighbourhoods at significant flood disadvantage. (i.e. none of their neighbourhoods have *both* high exposure *and* high social vulnerability).
- The Government should review its current approach to flood investment to consider whether issues of social vulnerability or wider deprivation are being adequately addressed, and whether a minimum standard of protection is needed for society.

## Introduction

Over the last ten years, the UK has seen significant floods, all of which have had a profound impact on those affected. Nearly 1 in 6 households in England is at some risk of flooding (DEFRA, 2015). The public expects the Government to be managing flood responses; recent research from Cardiff University shows 71 per cent of the population feel it has the main responsibility for protecting properties from flooding (Capstick, *et al.*, 2015).

In December 2014, the Government published its long term investment scenarios and six year investment programme for flooding (DEFRA, 2014a). These set out plans for £2.3 billion of government investment as part of the overall flood risk management policy framework. While sufficient investment is important, every pound spent must also provide the best long-term value for money. This should mean taking account of social as well as economic costs and impacts in investment plans.

Despite aspirations, strategic approaches are not always followed and public concerns can lead to political pressure for action when extreme flooding occurs. For example, following the winter floods of 2013–14, the Government invested £20.5 million in Somerset outside the official flood investment programme, without a formal cost-benefit analysis, and with an action plan drawn up in just six weeks. A separate rivers authority is also being established in Somerset which is expected to leverage funding locally and oversee local flood risk management. Such responses raise questions of equity in the context of the national programme and also highlight a need for a fundamental re-examination of the way in social vulnerability, and social protection are addressed in flood risk management policy.

**Headline message:** Adopting and responding to the concept of flood disadvantage in flood risk management could support more just responses in the face of climate change, demographic change and other socio-economic policy.

## What is flood disadvantage?

Flood disadvantage arises due to a combination of exposure to flooding and social vulnerability. Social vulnerability is caused by a range of factors which can be grouped into:

- personal factors (known as sensitivity) including age and health status
- social factors (known as adaptive capacity, or the ability to prepare, respond and recover), including income, tenure, mobility, social isolation, access to information and insurance

Exposure to  
climate hazard  
+  
social  
vulnerability  
=  
climate  
disadvantage

- environmental factors (which may increase or ‘enhance’ exposure) including housing and neighbourhood characteristics.

Overall, communities where high vulnerability and high exposure to flooding coincide may be the most flood disadvantaged – i.e. flooding may lead to a greater loss in wellbeing in these areas than elsewhere.

The University of Manchester has created a national index of social vulnerability to flooding based on the factors above and mapped the areas of greatest vulnerability and overlaid this with maps of flood exposure to identify areas of greatest flood disadvantage across England<sup>3</sup> (see page 24). The social vulnerability index is based on similar principles to that of the Index of Multiple Deprivation (IMD). However, the index is different in that it includes indicators which take better account of the socio-economic characteristics which affect the degree of social impacts created by flooding (see Table 1 in Section 3).

**Key message:** Flood socio-spatial vulnerability provides a more tailored indication of likely community preparedness and impacts than the Index of Multiple Deprivation alone.

## Why does it matter?

Not all communities and individuals will be affected equally by flooding, or have equal capacity to respond to a flood. Some are likely to experience worse effects on their health and wellbeing due to their personal, social or economic circumstances, combined with the surrounding natural and built environment, making them more vulnerable.

Those who are most ‘sensitive’ include: children; pregnant women; older people; people with physical, sensory and cognitive impairments; people with chronic illnesses; those receiving care at home (e.g. home oxygen, dialysis) and the homeless.

The surrounding environment can also play a role; people living in environments that lack green and blue infrastructure (e.g. places that store water such as, ponds, swales, canals and controlled storage spaces) or in ground level or basement level dwellings have a greater likelihood of being flooded or face greater impacts when floods occur and so face ‘enhanced exposure’.

Similarly, various factors can affect people’s ‘adaptive capacity’. For example, people on lower incomes are less likely to have insurance, so reducing their access to safety nets at a point of crisis, while also having fewer resources to deal with the loss of possessions after floods occur or to take precautions in advance. Other factors, such as social isolation, or having a different language and cultural background (where people are unable to understand flood warnings), may also make people more vulnerable and less able to cope in an emergency.

Climate change and extreme weather are also important considerations. Climate change can compound poverty and disadvantage and, conversely, poverty increases vulnerability to climate impacts (Banks, *et al.*, 2014). Failing to account for these factors in policy and investment plans may mean that certain parts of society are disproportionately impacted by floods over the long term, with subsequent cost implications.

Finally, vulnerability can also be significantly affected by the design of other policy frameworks, such as welfare reform or immigration policy (Wilson, *et al.*, 2013) or other socio-economic trends, such as an ageing society.

**Key message:** Certain parts of society could be disproportionately affected by flooding due to social vulnerability, climate change and extreme weather, and the design of related policy frameworks.

The potential social impacts of flooding for those at risk can be severe, including: trauma, illness, short-term water or power shortages (with associated health risks), displacement from homes, disruptions to livelihoods and longer term effects on mental health and wellbeing (WHO and Public Health England, 2013). These direct and indirect effects often translate into a need for further support from the Government and wider society (for example in terms of meeting housing need, or relocation of care home residents), with costs and impacts falling on the state. Such impacts raise questions about whether there is the need for more holistic economic appraisal, or a fuller consideration of social vulnerability when allocating investment. In addition there is a strong case for adapting wider national policy frameworks to account for socio-spatial vulnerability and the wider impacts of flooding to avoid these costs and impacts increasing over the long term.

**Key message:** Flooding creates both direct and indirect costs and impacts to society and the state, which are amplified by social vulnerability. Indirect costs and impacts are less well accounted for in policy, and make a significant contribution to the total impact of flooding.

In addition, the number of people exposed to flood risk is likely to increase because of climate change, social change and policy change. Climate change is likely to result in more frequent flooding due to higher river flows, and rising sea levels (DEFRA, 2012), while by 2050, 3.2 million people will be at risk of surface water flooding in urban areas from a combination of population growth and changing weather patterns (Houston, *et al.*, 2011). Climate change is not the only pressure; the UK faces an ageing and growing population. At the same time, the new flood insurance framework, Flood Re (DEFRA, 2014b), will support a transition to market prices for insurance. Market prices will place a higher cost burden on those who are living in areas at the highest risk of flooding, which may affect housing markets. This combination of factors has the potential to significantly increase the social impacts of flooding on communities.

**Key message:** Climate change will bring more frequent and extreme weather, increasing communities' exposure to flooding and the associated impacts and costs of floods, while other pressures, such as demographic change, and a transition to market pricing for insurance will increase social vulnerability.

Current approaches to addressing social vulnerability in national and local policies tend to focus on spatial exposure to hazards, rather than the broader social context, (including factors affecting people's ability to cope with floods). Current policy responses to climate change also tend not to explicitly address questions of equity in how decisions are made and actions are taken (Welstead, *et al.*, 2012; Banks, *et al.*, 2014) or take sufficient account of future social factors or climate trends. To ensure climate change does not risk compounding existing poverty, a concerted, focused effort is needed to embed these considerations across the spectrum of policy and practice, including in investment decisions.

**Key message:** Flood policy and investment decisions need to take account of pre-existing socio-spatial vulnerability and support actions to address the underlying issues, while also considering future climate and social trends.

## **Offering value for money? Comparing investment and disadvantage**

The Government's £2.3 billion investment programme for England seeks to minimise flood exposure through new projects, unlocking efficiencies through scale, and giving certainty to allow longer term planning. The programme includes 1,450 projects, in construction, development and in the pipeline, responding to coastal erosion and coastal and inland flood risk, with a further 47 schemes announced since. Government investment will not meet the total cost of schemes, with the rest coming from alternative sources including local authorities, businesses and communities, in a process known as partnership funding (DEFRA, 2011a, 2011b). This approach was introduced in 2011, to allow those at risk to be able to contribute to the costs of defences. The Government is seeking to unlock £600 million through this approach.

When calculating eligibility for central government funding (known as Flood Defence Grant in Aid (FDGiA)), payment rates for the numbers of households protected account for deprivation levels using the Index of Multiple Deprivation (IMD). Under this approach the Government pays 2.25 times more in the top 20 per cent of deprived areas, than in the 60 per cent least deprived areas. The potential benefits of a scheme known as outcome measures are monitored and regularly reported. Between April 2011 and September 2014, 19,974 households in the 20 per cent most deprived areas had been moved out of the significant or very significant river and sea flood risk categories to moderate or low risk (Environment Agency, 2015b).

While this represents good progress, a combination of increasing social vulnerability (as a result of demographic change, and policy changes such as market pricing for flood insurance), and exposure (from climate change) raises questions of whether the current

approach will continue to be sufficient, or whether there will be a need to provide a greater focus on flood disadvantage in future. Therefore the authors analysed which local authorities and parliamentary constituencies contained the most flood disadvantaged neighbourhoods<sup>1</sup> for both river and coastal flooding and surface water flooding in England to understand how flood disadvantage aligns with planned investment.<sup>6</sup>

This analysis identified:

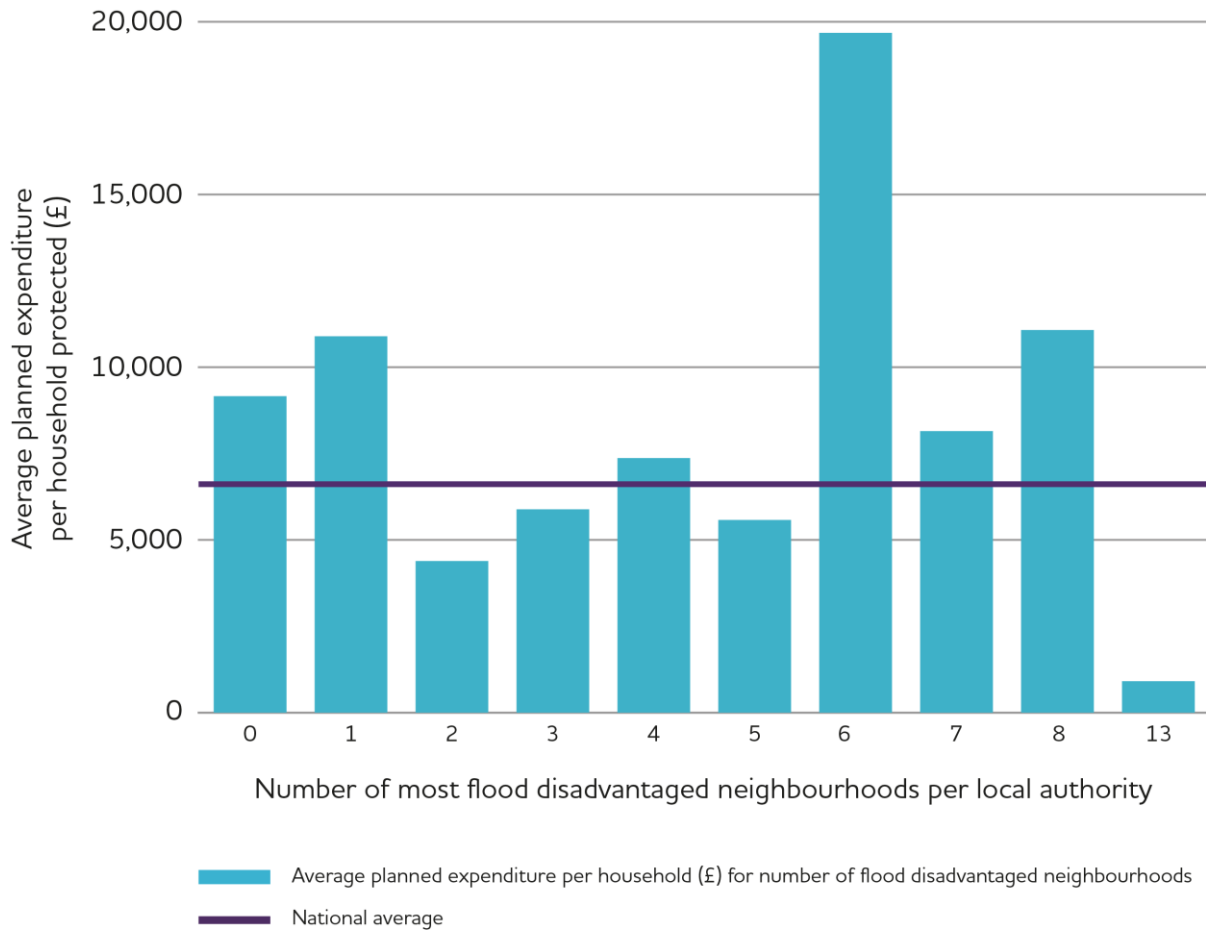
- 249 most flood disadvantaged neighbourhoods (184 from river and coastal flooding, and 65 from surface water flooding)
- across 135 of the 533 parliamentary constituencies, or 104 of the 326 district, borough or unitary local authorities.

The results were used to compare average planned expenditure per household protected<sup>2</sup> in a local authority, ranked by overall levels of flood disadvantaged neighbourhoods, against the national average (shown in Figure 1)<sup>5</sup>. In total, 100 of the 1,493 schemes analysed in the investment pipeline were located in most flood disadvantaged neighbourhoods.

The national average planned expenditure per household for a local authority was £6,610. However the analysis showed significant variations in the average expenditure in each local authority group. Some local authorities with lower numbers of most flood disadvantaged neighbourhoods will receive more on average than those with significantly greater numbers of disadvantaged neighbourhoods. For example, the average investment per household protected for local authorities with one most flood disadvantaged neighbourhood was £10,894, compared with £8,148 for local authorities with the seven most flood disadvantaged neighbourhoods. Within these groups, there is a significant range in the planned expenditure per household protected. For those with no disadvantaged neighbourhoods, planned spending ranged from £0 to £145,714, while for those with six or more flood disadvantaged neighbourhoods, the range was £405 to £43,504.

**Figure 1: Average planned expenditure per household protected (£) by local authority, by number of flood disadvantaged neighbourhoods**





This analysis suggests there is not a strong link between those local authorities which contain the most flood disadvantaged neighbourhoods, and levels of planned expenditure. To try and take better account of the scale of areas of flood disadvantage, the research looked at how investment compared with the proportion of local authorities at most flood disadvantage. This shows that a significant proportion of total planned expenditure will be in local authority areas with a lower proportion of their area identified as most flood disadvantaged. In particular, almost half or £2 billion of total planned investment (47.8 per cent) is for local authorities with no neighbourhoods at significant flood disadvantage (i.e. none of their neighbourhoods have both high exposure and high social vulnerability), with only 2 per cent going to those with 40 per cent or more of their area affected. In addition, those local authorities with a greater proportion of their area facing particular flood disadvantage have lower ranges of investment per household protected, and a lower average expenditure per household protected compared with areas with lower proportions of flood disadvantaged neighbourhoods.

Recognising that deprivation rather than social vulnerability is considered as a factor in determining levels of government investment, the authors also examined the extent to which the planned investment aligned with deprivation using the Index of Multiple Deprivation (IMD). However, there was no clear alignment between planned investment levels and 2010 local authority IMD scores. Similar results were found when the

locations of the schemes were mapped against the IMD deciles at the Lower Super Output Area (LSOA) level. Only 13.4 per cent of schemes in the programme were located in the 20 per cent most deprived areas in England, with 65.7 per cent in the 60 per cent least deprived areas.

Finally, the authors also considered the degree of rurality or urbanisation as the emphasis on household protection within current scoring for Flood Defence Grant in Aid (FDGiA) suggests rural schemes could become increasingly expensive, as the relative costs of protection are higher in sparsely populated areas (Chartered Institution of Water and Environmental Management, 2015). Planned expenditure per household to 2021 in predominantly urban areas was 66 per cent of total national allocations (£2.83 billion), compared with 34 per cent, or £1.45 billion in rural areas. This suggests that there will be future questions to consider over the balance between investment in urban areas (given increasing trends of urbanisation), and ensuring affordable flood risk management in rural areas.

**Key message:** Levels of planned expenditure in flood risk management to 2021 do not appear to align with areas of significant flood disadvantage, or with wider deprivation.

While exposure is and should be a strong driver of investment, the analysis presented here raises questions about whether sufficient consideration is being given to issues of social vulnerability to flooding in current investment approaches. There are gaps to the analysis as there may be projects unfunded outside the national programme which could address flood disadvantage<sup>7</sup> and data on the 2010–15 investment programme was not available for consideration at the necessary spatial scale for this project<sup>8</sup>. There will also be other considerations in funding such as the varying construction costs of schemes, that schemes may be protecting other areas and varying levels of deprivation within local authorities.

However, taken together:

- the differences between how IMD and social vulnerability to flooding are calculated
- the fact that flood investment levels are not clearly aligned with flood disadvantage – either considering the number of most flood disadvantaged neighbourhoods or the proportion of neighbourhoods affected within a local authority
- the lack of alignment between levels of flood investment and local authority and neighbourhood level deprivation
- the urban bias in the investment, and the fact that not all social and economic costs of floods are captured in current assessments
- cumulatively make a strong case for the Government to review whether the current investment approach needs to do more to address social vulnerability in the long term.



## Enhancing risk reduction and social protection in long-term investment scenarios and project appraisal

Alongside the Comprehensive Spending Review, the Environment Agency's Long Term Investment Scenarios (LTIS) inform government decisions relating to the overall budget for FDGiA expenditure. The latest version takes a cost-benefit approach, setting out an investment profile for flood and coastal erosion risk management where benefits exceed costs between 2015 and 2065. This approach recognises that investment in flood risk management creates multiple benefits for society. The Environment Agency estimates this approach provides an overall risk reduction of around 5 percent (Environment Agency, 2014).

The Long Term Investment Scenarios are based on a cost-benefit approach that seeks to obtain 'value for money'. However, the LTIS only include a limited consideration of wider costs and benefits for issues such as transport, commerce and industry. It does not address the distributional impacts or costs of flooding on the population, or social equity implications.

Such approaches have limitations. Nationally, there has been a push for alternative approaches which focus on risk reduction. The Association of British Insurers (ABI) states that *'...if such a [value for money] approach was actually taken, the likely result would be that areas at significant risk of flooding but with relatively low economic benefits such as rural or deprived communities would slip down the priority list'*, (ABI, 2014). This is echoed by the Adaptation Sub-Committee (ASC) of the Committee on Climate Change which points out that although levels of flood risk may fall over time:

*"...the gains will be due to hundreds of thousands of properties already at a relatively low risk of flooding being even better protected. ...These investments yield the greatest overall benefit per pound spent. But some households already in the high risk category (1-in-30 annual chance of flooding or greater) are expected to remain so, and others will join them as the climate continues to change."*

(Adaptation Sub-Committee, 2014a)

CIWEM (2015) highlights that:

*"...this means that in the longer term, tackling the high risk homes will become increasingly expensive, as, for example, they may be in sparsely populated areas, where the relative costs of protection are higher. This raises questions about what to do with properties in high risk areas in the longer term".*

In the Netherlands, new legal flood protection standards are being set which address both economic efficiency approaches and social protection from flooding. The Government follows a cost-benefit approach but also applies a minimum safety level which provides a basic level of safety for everyone behind the levees (flood bank), and

also takes societal disruption due to large-scale flooding and the protection of vital and vulnerable infrastructure into account. Cost-benefit analysis and social protection requirements are first considered separately, after which the final standard is based on the higher requirement of the two. These new standards have legal force from 2017 onwards and account for changes in socio-economic development through to 2050, as well as considering climate change through addressing flood probability.

Modelling and tools have been drawn upon to support this approach. In the UK there is a similar research and evidence base to inform such approaches. At the same time local authorities in England are increasingly capturing a wide variety of local impacts and costs from flooding, such as school closures, and demands on health and social care.

The existence of a workable policy framework in the Netherlands which seeks to maximise the benefits of the varying cost-benefit analyses, risk reduction and social protection approaches, as well as solid national and local evidence here, suggests that there is scope to improve social protection elements in future iterations of the LTIS and individual project appraisal in England.

**Key message:** The Government should clarify its overall goals for flood investment policy and consider including a clear goal relating to social protection.

### Improving the partnership funding approach

As outlined above, DEFRA also raises money in partnership with local areas, or the private sector for flood risk management (DEFRA, 2011a, 2011b). DEFRA's review of partnership funding (DEFRA, 2014c) highlights other areas of concern in flood investment:

- **Possible ineffective targeting of deprived communities** – DEFRA's evaluation found the 'explicit policy outcome focus on communities at high risk and high deprivation is not being realised' (to date). This stemmed from the fact that they could not reach a firm conclusion 'due to a lack of data in the Environment Agency's Medium Term Plan and a lack of strong evidence from the user experience analysis'. If this is indeed the case, partnership funding could be failing one of its core objectives, a cause for significant concern.
- **Clarifying the approach to raising £600 million in contributions** – DEFRA's evaluation shows that the majority of partnership funding investments came from the wider public sector, and recognised '... continued public sector funding cuts could impact on this level of contributions in the future'. While 25 percent of projects came from private income, the public sector would have to continue to play a significant role if the Government wants to reach its £600 million target. This reliance on the public sector looks set to continue as only £345 million in partnership funding is included in the investment plan to 2021 (Chartered Institution of Water and Environmental Management, 2015), leaving a £255 million shortfall against the Government's target. To enable all parties to properly plan, the Government needs to clarify how it plans to reach its target.

- **Development in the floodplain** – the review also found that partnership funding may potentially encourage new development in the floodplain. Private sector contributions to flood defence schemes were largely provided by direct beneficiaries such as major companies and developers. Although partnership funding cannot be used to protect properties built after 2012, some schemes will protect existing properties and open up land for development. While the planning process should ensure this does not circumvent the National Planning Policy Framework (NPPF) (DCLG, 2012), evidence from the Adaptation Sub-Committee (2012, 2014b) shows floodplain development is still increasing. There is therefore a need to explore whether partnership funding may be driving further development in floodplains and increasing longer term exposure to risk.

### Ringfencing of funding for lead local flood authorities

The Government allocates separate funding to lead local flood authorities (LLFAs) to fulfil their duties in relation to managing surface water. LLFAs are county councils or unitary authorities. Government funding for these functions is allocated through an annual local services support grant, based on levels of flood exposure, with further funding allocated through the main local government settlement process (known as the Settlement Funding Assessment) (DEFRA 2014d). In both cases, funding allocated nationally is not ringfenced.

This funding is not always spent on managing flood risk. The Adaptation Sub-Committee (2014b) cites a Local Government Association (LGA) study in 2012 where over a third of lead local flood authorities stated that at least some of the funding from DEFRA had not been allocated to flood risk management.

At a time when local government grant is reducing, and local authorities are feeling increased pressure from rising demands (Hastings, *et al.*, 2015), it is inevitable there will be trade-offs on using funds to meet local needs. However, failing to adequately cater for flooding brings the risk of locking in negative social consequences in future. To avoid this, funding for surface water flood management could be ringfenced to ensure local authorities have the capacity to plan appropriately over a longer term. This suggestion is also supported by the Environmental Audit Committee (House of Commons Environmental Audit Committee, 2015).

### **Flood disadvantage in flood risk management and socio-economic policy**

While investment is a critical part of flood risk management, the wider national policy framework for managing flood risk and increasing flood resilience also needs to take better account of the social context and equity issues. This consideration needs to be embedded across the spectrum of flood risk management policies, including in:

- national and local flood risk management strategies

- planning of maintenance of flood defences
- the implementation of sustainable drainage systems (SuDS)
- approaches to residual risk management and community and property-level protection (PLP)
- Flood Re (the new approach to flood insurance).

**Key message:** The national and local flood risk management policy framework should take greater account of flood disadvantage and the wider costs of flooding to increase the focus on long-term social protection as a central policy goal.

Given that the impacts of flooding are affected by social vulnerability, it follows that flood risk management is also affected by other socio-economic policies. Wider socio-economic policy can drive future vulnerability, affecting the impact of future flooding through changes to levels of deprivation, population density and wider decisions on infrastructure investment and land use. To date there has been limited consideration of this relationship. Therefore a focus also needs to be placed on reducing flood vulnerability through wider socio-economic policy.

**Key message:** Flood risk management and wider socio-economic policy frameworks are directly related. Socio-economic policy drives vulnerability to flooding, while failing to account for social vulnerability in flood risk management could increase pressures on

A key opportunity in this agenda relates to planning. There is an urgent need to balance the competing pressures of avoiding development in flood risk areas and meeting the UK's housing shortage. In doing this, there are issues around local authority and Environment Agency capacity to properly scrutinise and challenge planning applications. There is also a need for a better understanding of the groups of people being affected by planning decisions (e.g. tenure types and the mix of affordable/social housing being developed in areas of flood risk) to understand whether disadvantage is increasing and to inform the debate on whether an appropriate balance is being struck between meeting housing need and reducing flood risk. In addition, more information is needed on whether new development is reinforcing the need for greater risk management, and whether there is sufficient redress for residents of new developments that are exposed to flooding.

The next UK Climate Change Risk Assessment (UKCCRA) and National Adaptation Programme (NAP) (DEFRA, 2013) offer a key opportunity to improve our understanding of the interdependencies between socio-economic policy and flood risk management. By systematically mapping these linkages and exploring their relationships, there is the potential to implement further reform which could reduce social vulnerability to flooding, while recognising the increased risks posed by climate change. A spatial analysis of flood disadvantage should also inform the UKCCRA and NAP responses.

**Key message:** The next UKCCRA and NAP need to develop, and respond to, a stronger understanding of the relationship between social vulnerability to flooding and policies and funding streams that could address different aspects (considering exposure, sensitivity and adaptive capacity), to maximise resilience to flooding and reduce the costs to the public purse.

## Summary of all recommendations

Issue	Recommendation
<p>Considering social vulnerability and flood disadvantage in investment decisions and the total impacts and costs of floods could improve social protection.</p>	<ul style="list-style-type: none"> <li>• The Government should review its current approach to flood investment to consider whether issues of social vulnerability or wider deprivation are being adequately addressed, and whether a minimum standard of protection is needed for society.</li> </ul>
<p>Further reforms in flood investment policy could improve its effectiveness.</p>	<ul style="list-style-type: none"> <li>• Ahead of a formal policy implementation review, due in 2017, the Government should consider how to strengthen the partnership funding framework to achieve a stronger focus on most flood disadvantaged communities, and reduce incentivisation of unprotected floodplain development.</li> <li>• To allow all parties to plan effectively, the Government should clarify how it intends to meet the £600 million partnership funding target.</li> <li>• The Government should consider ringfencing surface water flood funding to lead local flood authorities to ensure it is spent on flood risk management.</li> </ul>

<p>Flood risk management policy could more effectively consider social protection</p>	<ul style="list-style-type: none"> <li>• The FCERM strategy for England should account for the uneven distribution of flooding impacts based on enhanced exposure, sensitivity and adaptive capacity, and ensure that this informs all flood risk management activity.</li> <li>• The Government should work with the Local Government Association (LGA) to embed a requirement to consider social vulnerability in local flood risk management strategies in guidance, and in development of plans for areas of high risk.</li> <li>• The Government should evaluate the potential efficiencies from providing longer term certainty around maintenance, including the effects of a review process to align maintenance needs with social vulnerability to flooding.</li> <li>• In actively monitoring the implementation of SuDS, the Government should consider:             <ul style="list-style-type: none"> <li>- the extent to which planning authorities have capacity to assess applications, and monitor the performance of conditions;</li> <li>- the extent to which exemptions of small-scale developments are impacting on overall exposure;</li> <li>- who is bearing the costs of SuDS maintenance, and the implications of this.</li> </ul> </li> <li>• The Government should continue to develop a strategic approach to the role of property level protection, as part of a wide range of approaches from the catchment to community and individual property scale. In particular:             <ul style="list-style-type: none"> <li>- the next Long Term Investment Scenarios should set out the role that resilience and resistance measures could have as part of an overall strategy;</li> <li>- research should be conducted on need and options for market intervention in relation to property level protection (PLP), including a direct support scheme for low-income households to purchase PLP as well as the role of other financial instruments and policy drivers.</li> </ul> </li> <li>• Flood Re’s transition plan should explicitly outline how it will seek to build resilience in highest risk areas. This should link strongly with approaches to residual risk management, such as PLP and community schemes, to ensure a joined up approach.</li> </ul>
<p>Better understanding the relationship</p>	<ul style="list-style-type: none"> <li>• Future work on flood risk arising from planning and new</li> </ul>



<p>between social vulnerability to flooding and socio-economic policy could further improve social protection.</p>	<p>development should include a focus on:</p> <ul style="list-style-type: none"> <li>- increasing understanding of the types of people affected, by linking data on new developments in all flood risk areas to data on tenure and development types;</li> <li>- surveying local authority planning departments and the Environment Agency to see if there is suitable capacity in place to assess both minor and major planning applications;</li> <li>- assessing whether local authorities have considered the impacts of unlocking land for development on their own risk management functions and those of the Environment Agency and water companies;</li> <li>- the difference a redress system could make to those who are put at risk of flooding due to new developments.</li> </ul> <ul style="list-style-type: none"> <li>• The next UK Climate Change Risk Assessment should, where possible:             <ul style="list-style-type: none"> <li>- include a spatial analysis of the distribution of risk that takes account of social vulnerability to the impacts of climate change;</li> <li>- examine the individual and cumulative effects of key socio-economic and adaptation policies in addressing vulnerability.</li> </ul> </li> <li>• The next National Adaptation Programme should use a spatial analysis of social vulnerability and exposure to different hazards to better target climate adaptation responses.</li> </ul>
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## For more information

For more in-depth analysis, including maps and charts, see the full report by Kit England and Katharine Knox, which is available as a free download from the JRF website: <http://www.jrf.org.uk/publications/targeting-flood-investment-and-policy-minimise-flood-disadvantage>

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