Institution: University of Surrey

Unit of Assessment: UOA 23 Sociology

Title of case study: Social inequality and vulnerability: informing strategies and policies on flooding

1. Summary of the impact (indicative maximum 100 words)

Over 5.5 million people in England and Wales live with flood risk. Research conducted at the University of Surrey illustrates for the first time how exposure to, and experience of, this risk is unequally distributed in the population, often varying along existing lines of social inequality and vulnerability.

The findings of this research have had significant impacts on national strategy and policy.

Surrey's research has been used to change the Environment Agency's flood warning codes and messages throughout the UK, as well as to inform the next Flood Incident Management Investment Strategy. Furthermore, the research has been drawn on by Collingwood Environmental Planning in developing an evidence base for the UK Climate Change Risk Assessment for Defra.

2. Underpinning research (indicative maximum 500 words)

Since 2000, the research team at Surrey has focused on understanding the significance of social inequalities for environmental risks and impacts and the ways in which they are experienced.

Initial work by K Burningham (2000-1) explored the environmental perspectives of socio-economically disadvantaged groups and provided some of the key concepts and foundations for a sustained programme of sociological research by K Burningham and J Fielding into the relation between inequality, vulnerability and environmental risk and impact. The key substantive focus of these projects has been flooding, and in one case adaptation to climate change. Surrey's research has broadly been based around:

- projects for the Environment Agency which have explored the social distribution of flood risk and flood awareness; researched situated understandings of vulnerability and resilience; and used the insights arising from the research to develop strategies for incorporating social science insights into policy.
- a further project for the Joseph Rowntree Foundation which extended considerations of environmental inequality and vulnerability into the realm of adaptation to climate change with respect to heat waves and drought.

Specific findings of Surrey's research relate to the social distribution of flood risk and awareness; for instance evidence that those in lower socio-economic groups are both more likely to be at risk from certain types of flooding and also less aware of this risk, and detailed understanding of the ways in which specific groups (notably older people, those in lower social classes and children) experience the impacts of floods.

In addition, recent research for ESRC and the Environment Agency involving J Moran-Ellis and K Burningham has extended the focus on the importance of socio-demographic differentiation for any consideration of the effects of environmental hazards through research into children and young people's experiences and agency in relation to flooding.

K Burningham, J Fielding, and J Moran-Ellis are members of academic staff.

3. References to the research (indicative maximum of six references)

1) Burningham, K. Fielding, J. and Thrush, D. (2008) '"It'll never happen to me": Understanding Public Awareness of Local Flood Risk', *Disasters: The Journal of Disaster Studies,* 31 (2): 216-238.

2) Fielding, J. (2007) 'Environmental injustice or just the lie of the land?: an investigation of the socio-economic class of those at risk from flooding in England and Wales' *Sociological Research Online,* 12 (4) 4 <http://www.socresonline.org.uk/12/4/4.html> doi:10.5153/sro.1570.

3) Fielding, J. and Burningham, K. (2005) 'Environmental inequality and flood hazard' *Local Environment*, 10 (4): 1-17.

4) Walker, G. and Burningham, K. (2011) 'Flood risk, vulnerability and environmental justice: evidence and evaluation of inequality in a UK context', *Critical Social Policy,* 31(2): 216-240.

5) Walker, M., Whittle, R., Medd, W., Burningham, K., Moran-Ellis, J. and Tapsell, S. (2012) '"It came up to here": Learning from Children's Flood Narratives', *Children's Geographies* 10 (2): 135-150.

Key projects which contributed to impact:

Project 1 (2001-2003)

Flood warning for vulnerable groups £99, 399.55 (Environment Agency (EA)) Kate Burningham, Jane Fielding, Diana Thrush

Project 2 (2004-2005)

Public Response to flood Warning £85,352.93(DEFRA/EA) Kate Burningham, Jane Fielding, Diana Thrush

Project 3 (2009-2010)

Children, Flood and Urban Resilience: Understanding children and young people's experience and agency in the flood recovery process £5,840 (Surrey total) (ESRC/Environment Agency/Hull City Council) Jo Moran-Ellis & Kate Burningham: project led by Will Medd, Lancaster University.

Project 4 (2010-2011)

Vulnerability to heatwaves and drought: adaptation to climate change: £2,587 (Joseph Rowntree Foundation) Kate Burningham with Magnus Benzie and colleagues at AEA consultancy.

4. Details of the impact (indicative maximum 750 words)

The programme of research has had a significant impact on *"major strategic shifts"* (Research Scientist at the Environment Agency) at the Environment Agency in the area of flooding, in two key respects.

- Two years ago, in 2011, the Environment Agency undertook a Flood Warning Service Improvements Project. A Research Scientist of the Environment Agency explains that this: *'used the evidence from your Public response to Flood Warning research (SC020116) to change the flood warning codes and messages'.* Both the number and design of the flood warning codes were changed in line with the focus group findings. As a direct result of Surrey's research, the Environment Agency introduced new flood warning codes in November 2010. With over 5.5 million people (one in six properties) living with flood risk in

England and Wales, the improvements made are expected to result in increased awareness of flood risk and greater public understanding of flood warnings and hence resilience.

- Secondly, research published in Burningham, K. et al. (2008) is currently informing the Flood Incident Management (FIM) Investment Strategy (from 2013 onwards) which sets the direction for flood forecasting, warning and response for the next 5-10 years. A Research Scientist of the Environment Agency writes: *'(we)are producing the evidence base for where the focus of investment in FIM should be to achieve the greatest benefits. This evidence base draws extensively from Burningham, K., Fielding, J., Thrush, D. (2008) '"It'll never happen to me": understanding public awareness of local flood risk', The Journal of Disaster Studies, Policy and Management 31(2)216-238'.*

The research has also had considerable impact in relation to Defra's UK Climate Change Risk Assessment (2012). A review of social vulnerability to climate change was carried out as part of the overall risk analysis, and parts of that work were then summarized in the main Evidence Report (Twigger-Ross & Orr 2012). Collingwood Environmental Planning who authored the report write:

'The work of Burningham and Fielding on vulnerable groups to flooding was a key source for the part of the review focused on flooding. In addition, the recent paper by Walker and Burningham (2011) was a key source for the conclusions within that review. Dr Burningham also inputted to the review via a short interview on vulnerability and climate change. Further, the work of the JRF (2011) funded project "Vulnerability to heatwaves and drought: adaptation to climate change" which Dr Burningham was a part of, was an important source for framing the concept of vulnerability'.

The Children, Flood and Urban resilience project, on which K Burningham and J Moran-Ellis were co-investigators, provided feedback to the Cabinet Office on the National Recovery Guidance and Strategic National Framework for Community Resilience regarding children, young people and frontline workers. The significant impact of this work was recognised by award of the second place prize for Outstanding Impact in Public Policy in the first ESRC Celebrating Impact Prize 2013 (http://www.esrc.ac.uk/news-and-events/press-releases/26059/researchers-celebrated-for-outstanding-impact.aspx)

5. Sources to corroborate the impact (indicative maximum of 10 references)

C1) Research Scientist 1 Evidence Directorate, Flooding and Communities, Environment Agency (Contact details provided)

C2) ESRC Impact Report Children, Flood and Urban Resilience (RES-177-25-0009)

C3) Technical Director, Collingwood Environmental Planning Limited (Contact details provided)

C4) Twigger-Ross, C. and Orr, P. (2012) *The UK Climate Change Risk Assessment 2012 Evidence Report: Annex B: Social Vulnerability to Climate Change Impacts*;

http://randd.defra.gov.uk/Document.aspx?Document=Evidence_Report_Annex_A_and_B.pdf

C5) Wallingford, H.R. (2012) *The UK Climate Change Risk Assessment 2012 Evidence Report.* http://www.defra.gov.uk/environment/climate/government/risk-assessment/