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Evaluation and Control Flood Risk for Surface Water

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Editorial

The interaction of biophysical and human variables creates the danger of surface water flooding. Rainfall frequency, length, and intensity, as well as drainage that happens when rain strikes the ground, are all determined by biophysical parameters. Rainfall may permeate the earth, but in urban areas with impermeable surfaces, rainwater will flow over the surface in directions influenced by the shape of buildings and roadways, accumulating at low topographical elevations.

Drains, which are meant to transport water away from metropolitan areas on the surface or in pipes, alter these processes. The sensitivity of the area and people exposed to the event, as well as the efficiency of surface water management initiatives where they are in place will all influence the risk. Due to rising urbanisation, the installation of sophisticated infrastructure and changes in precipitation patterns induced by human climate change, metropolitan areas throughout the world are becoming increasingly vulnerable to surface water floods. For instance, recent surface water flood occurrences in Brisbane in January 2011, Bangkok during the 2011 monsoon season, and Beijing in July 2012 should be highlighted.

Service disruptions, damage to key infrastructure and property, as well as larger social consequences, can all have severe consequences. Given future population, urbanisation, and anthropogenic climate change estimates, such catastrophes and their consequences are projected to worsen. Climate change is anticipated to raise hazards for people, assets, economies, and ecosystems in metropolitan areas, according to the Intergovernmental Panel on Climate Change, including risks from excessive precipitation.

Flooding is already acknowledged as one of the most common and costly natural catastrophes in the United Kingdom and it is designated as a serious risk on England's National Risk Register. Flood risk management has been designated as one of the priority areas for action over the next five years by the UK Climate Change Risk Assessment, since flood hazards are expected to grow dramatically across the UK over the next century. In the UK National Risk Register, surface water flooding is already recognised as the most likely source of property loss.

The entire economic cost of the floods was projected to be £3.2 billion, with consumers bearing £2.5 billion and insurers £1.8 billion. The intensity and nature of these floods varied from former floods in that a substantially larger proportion of flooding than usual was caused by surface water flooding rather than river flooding. The Pitt Review, which was performed in the aftermath of the 2007 summer floods to give lessons and suggestions, revealed severe gaps in the understanding and management of surface water flooding threats. Similar concerns have been expressed across Europe, noting that certain member states have previously placed a lesser focus on this form of flood risk, resulting in increased susceptibility.

The Pitt Review stressed the importance of making immediate and significant improvements to the UK's adaptation to the potential of increasingly frequent and intense episodes of excessive rainfall. According to the findings published in the UK Climate Projections, the UK weather in the future century will be characterised by increased days of intense precipitation as a result of climate change. Surface water flood occurrences are predicted to rise in the UK as a result of shifting precipitation patterns. Surface water flooding damages might grow by 60–220 percent over the next 50 years, according to Defra, when combined with a rising pattern of urbanisation. According to more recent predictions, under a 4°C climate scenario, the Expected Annual Damage from surface water flooding in England might increase by 135 percent by the 2080s.

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